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# ENVIRONMENTAL ASSESSMENT BOARD

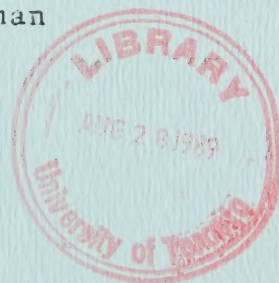
VOLUME: 125

DATE: Wednesday, August 16th, 1989

BEFORE: M.I. JEFFERY, Q.C., Chairman

E. MARTEL, Member

A. KOVEN, Member




FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810

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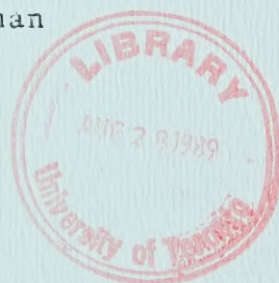
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL  
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR  
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental  
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental  
Assessment for Timber Management on Crown  
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the  
Honourable Jim Bradley, Minister of the  
Environment, requiring the Environmental  
Assessment Board to hold a hearing with  
respect to a Class Environmental  
Assessment (No. NR-AA-30) of an  
undertaking by the Ministry of Natural  
Resources for the activity of timber  
management on Crown Lands in Ontario.

-----  
Hearing held at the Ramada Prince Arthur  
Hotel, 17 North Cumberland St., Thunder  
Bay, Ontario, on Wednesday, August 16th,  
1989, commencing at 8:30 a.m.

-----  
VOLUME 125

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member







A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	MINISTRY OF NATURAL
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MS. Y. HERSCHER )	
MR. B. CAMPBELL )	MINISTRY OF ENVIRONMENT
MS. J. SEABORN )	
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	ASSOCIATION
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	WATCHDOG SOCIETY





(iii)

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MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION





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I N D E X   O F   P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>PETER KINGSBURY,</u> <u>LEONARD RITTER,</u> Resumed	20930
Continued Cross-Examination by Mr. Castrilli	20936





I N D E X     O F     E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
752 (reserved)	Excerpts of article entitled: The Effects of Paternal Subacute Exposure to Tordon 202c on Fetal Growth and Development in CD-1 Mice, P. M. Blakley, et al.	20968
753 (reserved)	Fax of letter from F. Y. Chang to unnamed on the status of Dr. Haganmaier's work dated March 22, 1989.	20970
754	Article entitled: Agricultural Herbicide Use and Risk of Lymphoma and Soft Tissue Sarcoma, Journal of the American Medical Association in September, 1986, conducted by the U.S. National Cancer Institute and several Kansas universities.	21020
755	12-page document entitled: Pesticide Fact Sheet issued September, 1988 by the U.S. EPA.	21024
756	Memorandum from Agriculture Canada to Canadian Association of Pest Control Officials Public Interest and User Groups dated September 19, 1986.	21046
757 (reserved)	Article entitled: Pesticide and Toxic Chemical News, dated September 4, 1986.	21046
758	Abstract entitled: A Case Control Study of Non-Hodgkin's Lymphoma and Agricultural Factors in Eastern Nebraska.	21089
759	United States District Court, Endorsement of the Jury Verdict, Ann Greenhill, et al vs. Dow Chemical, Company, dated December 7, 1987.	21107





Index of Exhibits (Cont'd)

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
760	Decision of the United States Court of Appeals for the Fifth Circuit in the State of Texas, Decision dated April 4, 1989.	21107
761	Excerpt from a report entitled: A Profile of 2,4-D Use and Exposure in Ontario presented to the Ministry of Environment.	21136
762	Excerpts from a document entitled: Environmental Effects of Fenitrothion Use in Forestry, dated March, 1989.	21170
763	Two-page excerpt of Forest Pest Management Institute Newsletter, Vol. 8, No. 1, Spring, 1989.	21182
764	Document entitled: Fenitrothion Avian Impact, Report No. 91, Forest Pest Management Institute, authored by P. Kingsbury.	21197
765	Document entitled: A Review of the Environment Canada Atlantic Region's Document (Environmental Effects of Fenitrothion Use in Foresty Impacts on Insect Pollinators, Songbirds and Aquatic Organisms).	21220
766	Excerpt of research report entitled: A 4-Week Oral Toxicity Study of 2,4-D, Amine Salt in the Albino Rat, authored by J. M. Morgan, et al, dated June 20th, 1986.	21223
767	Article entitled: Organohalogen Residues in Human Adipose Autopsy Samples from Six Ontario Municipalities by David T. Williams, et al, Vol. 71, No. 2, dated 1988.	21224





Index of Exhibits (Cont'd)

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
768	Report of the Auditor General of Canada to the House of Commons for the Fiscal Year ended March 31, 1988 re: Department of Agriculture and Pest Control Products Act.	21229
769	Document entitled: Problems Plague the Environmental Protection Agency's Pesticide Registration Activities, dated 1984, issued by the United States House of Representatives Committee on Government Operations.	21255
770	Copy of the Decision in Palmer, et al, versus the Nova Scotia Forest Industries in the Decision of the Nova Scotia Supreme Court Trial Division, September 15, 1983.	21264



1       ---Upon commencing at 8:35 a.m.

2                   THE CHAIRMAN: Good morning. Be seated,  
3 please.

4                   Ms. Murphy?

5                   MS. MURPHY: For the record, Mr.  
6 Chairman, over the evening we've had copies made of  
7 Exhibits 746 and 749. Those were documents that were  
8 discussed yesterday by Dr. Ritter and I thought we  
9 might as well provide those to the parties at this  
10 time.

11                  THE CHAIRMAN: Okay.

12                  MS. MURPHY: (handed)

13                  THE CHAIRMAN: Thank you.

14                  MS. MURPHY: And I had one other matter I  
15 would like to raise, if I could do that. .

16                  THE CHAIRMAN: Could you turn on your  
17 microphone? Is that on?

18                  MS. MURPHY: Yes, it is.

19                  PETER KINGSBURY,  
20                  LEONARD RITTER, Resumed

21                  MS. MURPHY: Over the evening Dr. Ritter  
22 contacted me and advised that he was having some  
23 difficulty in reviewing Exhibit 742 which is the  
24 exhibit: Guidance for the Reregistration of Pesticide  
25 Products Containing Picloram as the Active Ingredient.



1                   I simply asked him, when he advised me of  
2                   that, to take a minute this morning and explain to you  
3                   what his difficulty is.

4                   DR. RITTER: Mr. Chairman, we received  
5                   late yesterday, as you know, the longer version of the  
6                   picloram guidance document for reregistration which was  
7                   in addition to the rather abbreviated version which we  
8                   had received some time prior to that.

9                   Two things that I would ask you to note  
10                  about this longer version. The first is that it is not  
11                  the full document.

12                  The document, if one checks the index in  
13                  (i) through (iii), the full document actually runs  
14                  about 141 pages. The longer version of the document  
15                  which we have now been provided with runs 36, so this  
16                  is not the full document.

17                  The extent to which that may impede Mr.  
18                  Kingsbury and I in responding to questions, I'm  
19                  certainly prepared to endeavour to try to deal with  
20                  this item today rather than to delay it again, but I  
21                  would like, in saying that, just to add that qualifier;  
22                  that it is not the full document and that it may become  
23                  necessary for me to indicate that we are unable to  
24                  answer a question.

25                  That may be noteworthy because on page 29

1 of the longer document, which we have now received,  
2 there was some discussion in the abbreviated portion  
3 that we had looked at yesterday with regards to the  
4 adequacy of some of the studies and the fact that the  
5 agency did not consider many of the studies that it had  
6 adequate and was requiring that many of these studies  
7 be repeated.

8 Page 29, nevertheless, of the agency's  
9 regulatory position on the top of page 29 says:

10 "A review of the available information  
11 indicates that none of the risk criteria  
12 for adverse effects in 40 CFR, 154.7 have  
13 been exceeded. Available data indicate  
14 that picloram does not pose a risk of  
15 serious injury to humans, avian species,  
16 or aquatic organisms."

17 So while -- the reason I make this point  
18 is because while the agency is requiring that many of  
19 these studies be redone and resubmitted, I think for  
20 good reason, many of them are older, they are not  
21 taking that to mean that they feel that there is any  
22 risk at the present time, and that's exactly their  
23 stated conclusion.

24 So that it's important I think to view  
25 that in the context of the comments that are made about

1 the adequacy in the studies earlier on in the same  
2 document.

3 THE CHAIRMAN: Well, let's deal with the  
4 first question, which is: Basically, you weren't  
5 provided with the complete document and you are  
6 prepared this morning, as I understand it, to attempt  
7 answer questions put by Mr. Castrilli notwithstanding  
8 that. Is that your position?

9 DR. RITTER: That's correct.

10 THE CHAIRMAN: Then, as far as the  
11 conclusion you have just alluded to, that would be the  
12 subject I think of further examination on this document  
13 itself.

14 DR. RITTER: Yes, I understand that.

15 MR. CASTRILLI: Mr. Chairman, I can just  
16 note, the registration document is prepared by the U.S.  
17 EPA. Actually I am now sorrily tempted to provide an  
18 entire version of exhibit -- I'm sorrily tempted to  
19 provide an entire copy of, for example, Exhibit 748  
20 which is the reregistration document for 2,4-D, and I  
21 may well do that as a substitute for what is the  
22 current 748.

23 But I think when that's filed you will  
24 see that there is a standard form -- a standard format  
25 for the production of these documents and really the



1 substantive portion of the documents appear at the  
2 beginning. A series of standard form comments that  
3 apply to any pesticide, not just the one under review,  
4 can take up the bulk of the middle of the document, and  
5 at the end of the document are a series of tables that  
6 relate to the text discussion at the beginning.

7 So really it is only the first part of  
8 the document and the tables that are different in any  
9 one of these EPA reregistration documents.

10 The central portion contain all standard  
11 form comments which are really instructions to the  
12 registrant as to what to file, when to do it, and what  
13 deadlines to meet.

14 Dr. Ritter is not going to be hampered in  
15 any way in answering my questions by not having that  
16 central portion of the document.

17 THE CHAIRMAN: Well, I think, Mr.  
18 Castrilli, in fairness, if questions are going to be  
19 put to the witness and he is familiar with these  
20 documents I am sure, as much as you are, and he feels  
21 that it is necessary for him to be provided with the  
22 complete document, I think in fairness he should be  
23 allowed to have the complete document.

24 He is answering the questions, you are  
25 relying on his knowledge of what is contained in the

1 document together with his own personal expertise, and  
2 notwithstanding the central portion may be boiler plate  
3 material, if he feels it is necessary, I think he  
4 should be provided with a complete document.

5 MR. CASTRILLI: Very well. That's fine.  
6 We can wait and see.

7 As I indicate, I may well decide at some  
8 point to simply file the complete versions of what are  
9 now Exhibit 742 and 748 just to make sure that, in the  
10 Board's mind, there hasn't been anything material left  
11 out that could have been considered.

12 MS. MURPHY: And just to clarify, we are  
13 not suggesting that if someone is relying on a large  
14 document that they are required to file the entire  
15 document. Certainly that would be an undue --

16 THE CHAIRMAN: No, we are dealing with  
17 specific documents.

18 MS. MURPHY: But certainly that the  
19 person who is relying on a portion of the document  
20 should be able to make the entire document available  
21 for a review by other counsel or witnesses, if  
22 necessary.

23 THE CHAIRMAN: That's right. And that  
24 has been the standard practice throughout this hearing  
25 and other hearings.

1                   MR. CASTRILLI: And, as I indicated, I'm  
2 certainly in a position to do that with respect to the  
3 2,4-D reregistration document. I myself do not have  
4 the entirety of the picloram document. What I have is  
5 what I've now provided and is contained in Exhibit 742.

6                   THE CHAIRMAN: Well, in any event, with  
7 respect to Exhibit 748, put your questions to Dr.  
8 Ritter and if he does have difficulty, then we will  
9 have to put them over until he returns and after he has  
10 had an opportunity to see the full document.

11                  MR. CASTRILLI: That's fine. Thank you.

12                  CONTINUED CROSS-EXAMINATION BY MR. CASTRILLI:

13                  Q. Dr. Ritter, we were having a  
14 discussion yesterday on the subject of mutagenicity and  
15 2,4-D, we were discussing Exhibit 748 page 14.

16                  DR. RITTER: A. Page 14?

17                  Q. Yes.

18                  A. Yes.

19                  Q. Now, at the bottom of that page is  
20 the summary that we were discussing yesterday, and I  
21 just wanted to clarify for the record my understanding  
22 of what the situation is in Canada.

23                  The paragraph at the bottom of the page  
24 says:

25                  "No data are available on the mutagenic



1 potential..."

2 And let's just focus on mutagenic issues  
3 for the moment and not metabolism:

4 "No data are available on the mutagenic  
5 potential of 2,4-D..."

6 And you and I discussed the table at the  
7 back of Exhibit 748 which, in tabular form, sets that  
8 information out. Do you recall that discussion?

9 A. Yes, I do.

10 Q. And at page 86 it was clear; would  
11 you not agree, that with respect to gene mutation,  
12 structural chromosomal aberrations and other mechanisms  
13 of mutagenicity that the U.S. EPA did not have data  
14 that satisfied its requirements with respect to whether  
15 the product caused mutations for either the acids,  
16 amines or esters of 2,4-D; is that right?

17 A. That's their conclusion, yes.

18 Q. And in each case additional data must  
19 be submitted to meet that requirement and that's for  
20 the acids, amines and esters of 2,4-D; is that right?

21 A. Yes.

22 Q. And TGAI, which is the reference next  
23 to -- or found in column 2, is the technical grade  
24 active ingredient; is that right?

25 A. That's correct.

1 Q. Now, does Canada lack the same  
2 studies or did Canada lack the same studies in  
3 September, 1988?

4 A. In attempting to answer that  
5 question, Mr. Castrilli, for you in the latter part of  
6 yesterday afternoon, I indicated to you that at this  
7 time I simply do not know. And I further indicated to  
8 you that even if I can find out, I am not sure that I  
9 will be in a position to tell you.

10 It is noteworthy, as was noted by counsel  
11 yesterday, that there is most certainly reference to a  
12 variety of mutagenicity studies in a number of other  
13 documents.

14 Q. They all predate September, 1988; is  
15 that right?

16 A. That's correct.

17 Q. All right. So we have left it that  
18 you are going to determine what studies Canada has for  
19 August, 1989 and whether in fact they meet the  
20 requirements -- your requirements?

21 A. That's correct.

22 THE CHAIRMAN: And whether or not he can  
23 tell you about them--

24 DR. RITTER: Actually I'm going --

25 THE CHAIRMAN: --subject to further

1 argument.

2 MR. CASTRILLI: Subject to further  
3 argument for sure.

4 THE CHAIRMAN: Yes.

5 DR. RITTER: I'm going to endeavour  
6 actually to answer that second question first, because  
7 it may be the more relevant question.

8 MR. CASTRILLI: Okay, fine.

9 Q. And that's a matter that you will  
10 advise us of at the first opportunity; is that right?

11 DR. RITTER: A. I will certainly advise  
12 you probably this morning as to whether or not we are  
13 likely able to make that information available.

14 Q. Okay, that's fine. Thank you. Now,  
15 Dr. Ritter, we were also -- while we are at page 14 of  
16 Exhibit 748, the EPA summarized its position or the  
17 situation as of September, 1988 by indicating that no  
18 data are available on the metabolism of 2,4-D as of  
19 September of 1988.

20 And, again, page 86 of the same exhibit  
21 indicates that for the acid, amine or ester of 2,4-D,  
22 the agency did not have satisfactory data to meet its  
23 requirements as of September, 1988 and that additional  
24 data had to be submitted for each of those types of  
25 2,4-D and the time frame for submission of that was 24

1 months from September, 1988; is that right?

2 A. That's the conclusion of the  
3 document, that's correct.

4 Q. Now, I wanted to clarify what the  
5 situation is in Canada. Is it the same?

6 A. No, it is not. In fact, I was  
7 present at a Science Advisory Panel meeting hosted by  
8 the U.S. Environmental Protection Agency in which  
9 metabolism data were discussed in the building occupied  
10 by the Environmental Protection Agency at which EPA  
11 staff were present.

12 So I'll give you two answers to your  
13 question. The first is the situation is not that in  
14 Canada now and was not at the time that the document  
15 was published and, indeed, I can tell you that there  
16 were metabolism data available to EPA at the time this  
17 document was published.

18 Q. That met its requirements and meets  
19 Canada's requirements?

20 A. I'm not in a position to comment as  
21 to whether or not a study meets EPA requirements. I'm  
22 simply saying that there was a metabolism study in the  
23 hands of the Environmental Protection Agency at the  
24 time that this document was published. Absolutely no  
25 question about that.



1                   Q. Well, just focusing on Canada,  
2 something you do know about, does the existing data  
3 with respect to metabolism of 2,4-D meet -- that you  
4 have, meet Canada's requirements?

5                   A. The study which we reviewed was a  
6 study which was carried out in line with contemporary  
7 protocols for metabolism studies. It certainly  
8 satisfied the kinds of features that one would normally  
9 look for in a conventional metabolism study.

10                  There are additional metabolism studies  
11 which have -- which may be requested from the industry  
12 task force on 2,4-D, but I would not want to leave you  
13 with the impression that because additional data in  
14 that regard may be required that that somehow or  
15 another implies that the initial study was flawed.  
16 That's incorrect.

17                  It is just that there have been a number  
18 of questions which have arisen from the review of the  
19 2,4-D information which, at least in our view, some  
20 additional metabolism data may be useful in  
21 interpreting.

22                  Q. Well, have you made a determination  
23 as to the adequacy of the main new body of metabolism  
24 data, if I can put it that way, and whether it meets  
25 Canada's requirements?

1                   A. Yes, I'm trying to answer that. The  
2 data is fine, there is nothing wrong with the data as  
3 far as complying with requirement is concerned, that's  
4 not the issue.

5                   What I'm saying is that we may require,  
6 and I emphasize may, that additional metabolism studies  
7 be carried out, not because the original data is in any  
8 way flawed but because there have been a number of  
9 questions that have arisen which, in our view, may be  
10 in part answered by the generation of additional  
11 metabolism data.

12                  So the study which was submitted was a  
13 properly conducted metabolism study which certainly  
14 complied with contemporary requirements for studies of  
15 that kind.

16                  Q. Well, the \$24 question is, the data  
17 may meet your requirements but are the findings  
18 positive or negative with respect to metabolism?

19                  A. Metabolism studies don't produce a  
20 positive or negative finding. Metabolism studies are  
21 designed to indicate the disposition of a chemical once  
22 it gets into the body and, to that extent, the  
23 metabolism data which was submitted answered that  
24 question.

25                  Metabolism studies per se don't indicate

1 the presence or the absence of an adverse effect, but  
2 merely how a chemical is handled once it comes into the  
3 body.

4 Q. Well, it does tell you what the  
5 breakdown products are; does it not?

6 A. Yes.

7 Q. So are the additional data  
8 requirements in relation to concerns you have about  
9 what the breakdown products are?

10 A. Mr. Castrilli, I really can't answer  
11 your question in any more detail. That is a matter  
12 which is being discussed with the industry task force  
13 and internally, and really the requirement for that  
14 study and the results that gave rise to our perhaps  
15 requiring additional metabolism data is, in my view,  
16 proprietary.

17 I really can't discuss that with you any  
18 further here.

19 MS. MURPHY: I simply rise on another  
20 point actually. There has been a number of -- a series  
21 of questions put about the time that certain data was  
22 available and so forth.

23 Just as a matter of assistance, I might  
24 point out to you in this document, which is Exhibit  
25 742, on page 11 -- I'm not certain if you have page 11

1 in the actual exhibit.

2 THE CHAIRMAN: 748 or 742?

3 MS. MURPHY: Sorry, 748.

4 MR. CASTRILLI: Page 11 is there.

5 MS. MURPHY: It just points out that the  
6 review data that they are discussing here are basically  
7 those studies available to the agency as of February  
8 20th, 1987.

9 So with respect to questions about when  
10 they had certain information, I thought it might be  
11 wise to just point that out at this point in time.

12 DR. RITTER: Mr. Castrilli, in an attempt  
13 to assist you, the question that you asked me was  
14 whether or not Canada had metabolism data which  
15 appeared to be lacking from that last sentence on page  
16 14 on the document. The short answer to your answer is  
17 yes, we have it now, it has satisfied protocol  
18 requirements, we had it in September, 1988.

19 To the extent that it's useful to you at  
20 all, I can verify for you absolutely that that very  
21 same study was available to the agency in September of  
22 1988 because I was at a meeting with agency staff where  
23 that study was discussed.

24 So there is absolutely no question in my  
25 mind whatsoever that the agency had that metabolism



1 study in September, 1988.

2 MR. CASTRILLI: Q. If you would provide  
3 that information, that would be fine.

4 DR. RITTER: A. I've just provided it.

5 Q. In written form. Did you say it was  
6 a document?

7 A. Well, I can't give you the metabolism  
8 study.

9 Q. I'm not talking about the document as  
10 in the study. I'm saying, if you have some written  
11 indication that the study has been filed, because you  
12 referred to a federal registered document, for example.  
13 Isn't that what you are referring to?

14 A. Yes.

15 Q. Isn't that what you are referring to?

16 A. I am referring -- well...

17 MS. MURPHY: I think the witness just  
18 said he was present on occasion where this was  
19 discussed. That was the evidence.

20 THE CHAIRMAN: Well, no, I think there is  
21 some misunderstanding as to whether this document is on  
22 the federal register or was filed in that fashion or  
23 whether it was just a document discussed at a meeting.

24 DR. RITTER: Mr. Chairman, I wonder if I  
25 may consult with Ms. Prupas for a moment.

1 THE CHAIRMAN: Very well.

2 ---Discussion off the record

3 DR. RITTER: Mr. Castrilli, I would refer  
4 you to -- I was present at a meeting, as I indicated,  
5 which the Environmental Protection Agency held some  
6 time ago with its Science Advisory Panel where the  
7 issue of metabolism was discussed, and I can't give you  
8 any further verification of that other than the fact  
9 that I attended.

10 There are a series of Federal Register  
11 notices. As you know, it is the custom of the  
12 Environmental Protection Agency to periodically publish  
13 updates of its reviews on various products in the  
14 United States Federal Register and 2,4-D has been no  
15 exception to that rule.

16 There are at least two references, one of  
17 which I can give you directly now, on 2,4-D pertaining  
18 to that subject in general in which a variety of  
19 studies are reviewed.

20 The first reference is Volume 53, No. 56,  
21 Wednesday, March 23rd, 1988 of the United States  
22 Federal Register and it is entitled: 2,4-D, 2,4-DB  
23 and 2,4-DP, Proposed Decision not to Initiate a Special  
24 Review.

25 There was, if memory serves me correctly,

1 a subsequent Federal Register Notice or perhaps it's an  
2 earlier Federal Register Notice in September, I believe  
3 September of '88, so it would be subsequent to this, in  
4 which there was further elaboration on this same  
5 subject.

6 Those are the references I believe that  
7 you will find useful in the context in which we're  
8 discussing it.

9 Incidentally, the meeting to which I'm  
10 referring in which metabolism data was discussed was  
11 held in Arlington, Virginia on June 25th, 1987. It was  
12 a meeting of the Federal Insecticide, Fungicide and  
13 Rodenticide Act, Scientific Advisory Panel of the U.S.  
14 Environmental Protection Agency.

15 MR. CASTRILLI: All right, that's fine.

16 Q. Was there -- sorry. Let me just  
17 return then to another aspect of the 2,4-D studies.

18 Are you aware of studies with respect to  
19 2,4-D which have observed systemic and developmental  
20 effects at the lowest dose tested in experimental  
21 animals?

22 DR. RITTER: A. There have been -- if  
23 you are referring to teratology studies, there have  
24 been teratology studies that have indicated terata at  
25 doses approaching the highest dose in these studies,

1       that's correct.

2                   Q.   Are you familiar with a Hazleton  
3       Laboratory's report from 1983, a 90-day feeding study  
4       in rats which showed kidney tissue damage observed at  
5       the the 1 milligram per kilogram per day level, the  
6       lowest dose tested?

7                   A.   Yes.

8                   Q.   And that showed developmental  
9       effects; did it not?

10                  A.   No.   Developmental effects is a term  
11       we tend to use to refer to birth defects; that is,  
12       effects in the development of an embryo.

13                  And the effects that you're referring to  
14       would generally be considered as chronic or sub-chronic  
15       in the case of a 90-day study, but not developmental.

16                  Q.   Are you aware of a 2,4-D study which  
17       showed delayed hardening of the skeleton in fetuses of  
18       test animals again at the lowest dose -- lowest  
19       developmental dose tested?

20                  A.   That's the study, in fact, that I was  
21       referring to a moment ago when I said that there has  
22       been positive results, if you like, obtained in  
23       teratology studies.

24                  Q.   If these studies in fact make those  
25       conclusions, Dr. Ritter, would it be fair to say that



1 exposure to 2,4-D may be a cause of adverse systemic  
2 and developmental effects at low doses?

3 A. No, I wouldn't agree with your  
4 conclusion. I'd refer you, Mr. Castrilli, to the  
5 document which you made available, Exhibit 748, on page  
6 14, under the heading of Teratology Studies and I'll  
7 read just in part:

8 "Teratology study in rats was negative  
9 for teratogenic effects at the highest  
10 dose tested of 75 milligram per kilo per  
11 day."

12 As you can appreciate, I would imagine  
13 there are more than a single parameter which is  
14 evaluated in a teratology study, even though a  
15 teratology study, per se, is carried out for the  
16 purpose of evaluating developmental effects.

17 So that there were no terata noted in  
18 this study, no birth defects noted in this study, as  
19 this report indicates, up to the highest dose tested.

20 There are other effects which are  
21 examined in a teratology study, such as maternal  
22 toxicity and overall toxicity to the fetus other than  
23 birth defects and, for those effects, the no effect  
24 level in this study was set at 25 milligram per kilo  
25 per day.

1                   The kidney effects that you refer to in  
2                   the 90-day study I would not say suggest potential  
3                   serious adverse effects. In fact, Mr. Castrilli, quite  
4                   the contrary. The effects were considered by many to  
5                   be so trivial and to have such little biological  
6                   importance that it was that very 90-day study that, in  
7                   the minds of some, has cast some doubt on the validity  
8                   of the cancer study doses which were based on that very  
9                   90-day study.

10                  So I would say that the conclusion that's  
11                  been reached by the agency in this very document, with  
12                  regards to that 90-day study, is actually the contrary  
13                  of what you've just said. They've concluded that the  
14                  90-day study probably does not provide significant  
15                  evidence of an adverse effect.

16                  MS. CRONK: Excuse me, Mr. Chairman. Mr.  
17                  Castrilli has referred the witness to two studies which  
18                  clearly had been provided to the witness.

19                  I wonder if they might be made available  
20                  to other counsel.

21                  MR. CASTRILLI: No such studies were  
22                  provided to the witness. One of them is incapable of  
23                  being provided -- I would imagine neither of them are  
24                  capable of being provided since they would probably be  
25                  confidential.

1 DR. RITTER: That's correct. In the  
2 interest of protecting that confidentiality, anything  
3 that I'm saying can be extracted entirely from the  
4 2,4-D position document, the U.S. 2,4-D position  
5 document.

6 THE CHAIRMAN: Where did you find out,  
7 Mr. Castrilli, is it from this document?

8 MR. CASTRILLI: From this document and  
9 also from something called EPA Talks One Liners which  
10 are summaries of -- put out by EPA from time to time.

11 MS. CRONK: Mr. Castrilli then has  
12 asserted certain conclusions in those studies to the  
13 witness and I simply ask him to put clearly on the  
14 record, for the benefit of other counsel then, the  
15 authors that he referred to in those two studies.

16 I would just like to get the references  
17 down. He mentioned them quickly and I did not get them  
18 down.

19 MR. CASTRILLI: Let me give you the cite  
20 for the one study that I have available. I referred to  
21 a Hazleton --

22 MS. CRONK: If he has the study  
23 available, I would like a copy of it. I thought he  
24 didn't have it.

25 MR. CASTRILLI: Ms. Cronk, with all due

1       respect, the gamesmanship is a little early in the day  
2       for that sort of thing. The study I referred to is  
3       Hazleton Labs Inc. 90-day feeding study in rats, 1983,  
4       No. 2184-102.

5                       If Ms. Cronk has any success finding or  
6       obtaining a copy of that study, I truly would be  
7       amazed.

8                       MS. CRONK: Sir, could I just have the  
9       cite again. And I can only say to the Board it is in  
10      an effort to at least follow what has happened this  
11      morning. Can I have the cite again, please?

12                      MR. CASTRILLI: Hazleton Labs Inc. 90-day  
13      feeding study in rats, 1983, No. 2184-102.

14                      MS. CRONK: I am very grateful, sir.  
15      Thank you.

16                      DR. RITTER: Mr. Chairman, I wonder if I  
17      could perhaps expand on that a little bit, maybe I can  
18      clarify the situation.

19                      90-day studies, Mr. Castrilli, as I  
20      indicated during my formal presentation last week, are  
21      done primarily for the purpose of assisting and  
22      establishing appropriate dose levels for the subsequent  
23      cancer study. In themselves 90-day studies are not  
24      often considered to be very informative or useful.

25                      Now, you will note from this document,



1 I'm sure, that you've distributed that the suitability  
2 or the adequacy of the top dose used in the cancer  
3 studies has been called into question by the  
4 Environmental Protection Agency, and I'd refer you  
5 specifically to page 14 of their report, second full  
6 paragraph on the top.

7 MR. CASTRILLI: Q. Dr. Ritter, let's  
8 talk about the teratology studies for a moment.

9 THE CHAIRMAN: Just hold on a minute, Mr.  
10 Castrilli. If Dr. Ritter wants to explain and try and  
11 clarify some of the information he is giving, either  
12 today or yesterday, the Board wants to hear it.

13 You will have an opportunity to ask your  
14 questions in a moment.

15 MR. CASTRILLI: Well, I just want to  
16 clarify whether he is talking about the teratology  
17 studies or some other matter, because my questions were  
18 in relation to teratology.

19 DR. RITTER: No, they were not. You  
20 indicated that the 90-day study suggested potentially  
21 serious adverse effects at very low dose levels. I  
22 think we can have the transcript read back if you would  
23 like your precise question.

24 MR. CASTRILLI: Q. All right. So your  
25 answer is in relation to what matter?

1 DR. RITTER: A. To that 90-day study.  
2 What I'm trying to indicate is that the 90-day studies  
3 are done primarily for the purpose of assisting in  
4 developing a dosing schedule for the cancer studies.

5 The second full paragraph on page 14  
6 indicates that the agency had some difficulty with the  
7 adequacy of the top dose utilized in those very cancer  
8 studies and that is because, in the opinion of the  
9 agency, as is contained in this document, the 90-day  
10 studies used to help determine the doses for the cancer  
11 study actually probably didn't produce a significant  
12 adverse effect.

13 So that the no effect level of 1  
14 milligram in the 90-day study which you referenced,  
15 does not necessarily mean that there was a serious  
16 adverse effect at 1 milligram, it simply means that  
17 there was an effect noted without regard to its  
18 severity.

19 And a subsequent discussion in this  
20 document on the cancer studies would suggest actually  
21 the opposite to what you have concluded; rather than  
22 suggest that the 90-day study implied a serious adverse  
23 effect, the agency has actually concluded that it  
24 suggested virtually no adverse effect at all and,  
25 consequently, called the adequacy of the doses into

1 question.

2 Q. Well then, Dr. Ritter, isn't it fair  
3 to say that in fact the U.S. EPA does not have data  
4 adequate to satisfy requirements with respect to  
5 teratogenicity of 2,4-D?

6 A. We are talking about two different  
7 studies, Mr. Castrilli. I'm was referring to the  
8 90-day. The teratology study is not the 90-day study.

9 If you are asking now specifically about  
10 the teratology study, the document which you made  
11 available indicates that the agency is satisfied with  
12 the rat teratology study and is requesting a non-rodent  
13 teratology study; namely, to be conducted in the rabbit  
14 and that is conventional requirement that teratology  
15 testing be conducted in two species, one of which must  
16 be a non-rodent and that is the conclusion of the  
17 agency.

18 Q. Page 85, Dr. Ritter, of Exhibit 748.

19 A. Yes.

20 Q. The heading on the page is again  
21 Generic Data Requirements for 2,4-D. And you will see  
22 at the bottom of the page, teratogenicity, two species,  
23 rat and rabbit.

24 A. Yes.

25 Q. Can you confirm for me that, with the

1 exception of the 2,4-D study in the -- sorry, the 2,4-D  
2 acid study which the agency indicates it does have  
3 satisfactory requirements for, it does not have  
4 satisfactory requirement -- does not have a study that  
5 satisfies its requirements for the other five  
6 categories of teratogenicity?

7 A. That is their conclusion, that's  
8 correct.

9 Q. Is that the situation in Canada?

10 A. We have requested, like the  
11 Americans, a repeat non-rodent teratology study.

12 Q. You have not requested a study with  
13 respect to the 2,4-D esters or amines?

14 A. That's correct.

15 Q. And why is that?

16 A. As we discussed yesterday, Mr.  
17 Castrilli, there has been some discussion and work over  
18 the years in order to establish the bio-equivalence of  
19 the various forms of 2,4-D; namely, the acid ester and  
20 amines.

21 The agency themselves, in fact, have  
22 concluded - and I noted it last night in doing this  
23 homework - I would refer you, Mr. Castrilli, to page 12  
24 of the 2,4-D document on this issue of bio-equivalence.  
25 The large paragraph in the middle of the page: "The



1 major..."

2 Q. The one beginning: "The major..."?

3 A. That's correct. "The major..." --  
4 this is in the section entitled: Toxicological  
5 Assessment:

6 "The major exposure to these compounds is  
7 during application. Considering the  
8 common 2,4-D moiety in each compound, it  
9 could be expected that the 2,4-D portion  
10 of each molecule would be released during  
11 use. Thus, exposure would be to 2,4-D  
12 regardless of which 2,4-D compound is  
13 used."

14 What that says in essence, Mr. Castrilli,  
15 is that there is very good scientific evidence to  
16 suggest that there is a high order of biological  
17 equivalence between the various forms of the compound  
18 which are available for sale.

19 While it might be interesting from a  
20 theoretical sense to test both the ester, amine and  
21 acid, from a practical sense we are all exposed to the  
22 acid and I'm not really convinced that it would serve  
23 any larger scientific purpose to require that all of  
24 these studies be conducted on all of the forms when we,  
25 and indeed the agency have at least in part concluded,

1       that all of these forms are biologically more or less  
2       the same.

3                   Q.   Dr. Ritter, isn't it true, if you  
4       look at the next paragraph, that the agency is  
5       indicating that:

6                   "Toxicological data for the acid and for  
7                   each amine and ester are considered  
8                   necessary to determine if the toxicity of  
9                   these organic amines and esters differ  
10                  significantly from the acid and from each  
11                  other and whether these toxic effects  
12                  constitute an unacceptable risk to  
13                  applicators."

14                  Isn't the agency in a very practically  
15       oriented document which is what 748 -- Exhibit 748 is  
16       all about, concluded that in fact it must have the data  
17       with respect to esters and amines as well?

18                  A.   Yes, that is what it's concluded.

19                  Q.   And isn't it also true, Dr. Ritter,  
20       that the agency has indicated that, among other things,  
21       the esters or amines may greatly influence the physical  
22       characteristics, biological activity and...

23                  MS. MURPHY:   Which page are you reading  
24       from?

25                  MR. CASTRILLI:   Page 4.

1                   Mr. Chairman, page 4 is a page you may  
2                   not have and that is why I'm likely to file the  
3                   entirety of this document, but the witness does have  
4                   page 4.

5                   Q. Let me just read the entire  
6                   paragraph, Dr. Ritter:

7                   "Most often the acid is not formulated as  
8                   an end use product, instead the typical  
9                   end use product as applied is usually a  
10                  formulation of an amine or ester of the  
11                  parent compound. With these formulations  
12                  the esters or amines may greatly  
13                  influence the physical characteristics,  
14                  biological activity and environmental  
15                  fate of the chemical. The agency has  
16                  little or no data to evaluate the  
17                  behaviour of these compounds in the  
18                  environment, therefore, the data  
19                  requirements in this standard are  
20                  address not only the acid and its  
21                  inorganic salts but also the amine  
22                  Salts and the esters."

23                  And that is why I presume, Dr. Ritter, we  
24                  see at page 86 a reference to having -- to the agency  
25                  having no data with respect to teratogenicity for the

1 acids and amines -- excuse me, for the esters and  
2 amines; is that right?

3 DR. RITTER: A. Yes, yes.

4 Q. Now, it's your position and it's  
5 Canada's position that notwithstanding that view of the  
6 U.S. EPA, Canada does not believe it requires  
7 information on anything other than the 2,4-D acids; is  
8 that correct?

9 A. No, it's not the position of Canada,  
10 it's the position of the Department of Health and  
11 Welfare that additional testing on forms other than the  
12 acid for the purpose of toxicologic assessment would,  
13 in all likelihood, not provide any useful information.

14 I should note, Mr. Castrilli, as I did  
15 the other day, that exposure studies that are carried  
16 out are carried out on the end use formulation, so that  
17 if the amine or ester were to provide enhanced uptake  
18 or absorption of the chemical, that would be apparent  
19 to us from the exposure information, but that once that  
20 amine or ester gets into your body, it becomes the acid  
21 and, consequently, from a toxicological point of view,  
22 you are exposed essentially to the acid once exposure  
23 has taken place and it is on the acid for which these  
24 studies have been done.

25 Q. The exposure studies have been done?



1                   A. No. The exposure studies are done on  
2 the end use formulation; that is, if one is talking  
3 about using an amine, the exposure study is done on the  
4 amine. If one is talking about using an ester, the  
5 exposure study is done on the ester.

6                   I might add, just anecdotally, esters are  
7 no longer very popular in Canada or indeed anywhere  
8 else because of their volatility. So that the  
9 predominant forms of the compound which are now used  
10 are the acid or the amine.

11                   But regardless, if the end use  
12 formulation is an acid, the exposure study is done on  
13 acid and so on and so forth. So that if the ester or  
14 amine formulation were to provide an opportunity for  
15 enhanced uptake, that would become evident from the  
16 exposure studies.

17                   Toxicologically, whatever you are exposed  
18 to, very rapidly becomes the acid once absorption has  
19 taken place. So that from a toxicological assessment  
20 point of view you are exposed essentially to the acid.

21                   THE CHAIRMAN: Dr. Ritter, can you help  
22 the Board with this question. Various jurisdictions  
23 around the world are obviously conducting their own  
24 sets of studies to the extent that they feel they are  
25 necessary on a variety of compounds, 2,4-D included.

1                   Just because a particular jurisdiction  
2 demands or requires a certain set of studies, does that  
3 necessarily mean that other jurisdictions will  
4 automatically follow suit, in your experience, or that  
5 there should, in your professional opinion, be a  
6 conclusion drawn that a particular jurisdiction is not  
7 necessarily conducting valid testing because a  
8 particular study is absent from their testing program?

9                   Is there enough unanimity amongst the  
10 scientific community between various jurisdictions to  
11 have almost a given standard in place and any deviation  
12 from that standard somehow impunes studies that one  
13 jurisdiction or another are conducting?

14                  DR. RITTER: The short answer is no. The  
15 fact that a given jurisdiction may or may not require a  
16 study which is being required elsewhere, in no way  
17 implies the necessity or the lack thereof of conducting  
18 that study.

19                  A scientific practice, like any other  
20 technical field, is very much a question of  
21 interpretation and judgment and it's entirely possible  
22 and plausible that two scientific jurisdictions will  
23 arrive at somewhat dissimilar conclusions from exactly  
24 the same set of data and that, I don't think,  
25 necessarily implies that either one has made an error,

1 but that perhaps they have simply interpreted the data  
2 somewhat differently.

3 THE CHAIRMAN: Okay, thank you.

4 MR. CASTRILLI: Q. Dr. Ritter, just so  
5 that I am clear then. Looking at page 85 of Exhibit  
6 748.

7 DR. RITTER: A. Yes.

8 Q. Under the heading of Teratogenicity,  
9 in Canada -- if one were to produce a similar table for  
10 Canada, can I take it that there would just be one acid  
11 or one test -- I'm sorry, put it this way: There would  
12 be data only for the 2,4-D acid with respect to  
13 teratogenicity?

14 A. That's correct.

15 Q. And Canada regards that as adequate;  
16 is that right?

17 A. That's correct.

18 Q. And there would not be anything --  
19 there would not be five other categories as we have  
20 here; is that right?

21 A. That's correct. In fact, Mr.  
22 Castrilli, we sponsored a study which was conducted on  
23 our behalf at Bio Research Laboratories in Montreal to  
24 examine the bio-equivalence of the acid and amine  
25 formulations, the bio-equivalence not the

1 penetrability, not the absorption because we recognize  
2 that those are different.

3 Q. You can't be heard.

4 A. I'm sorry. We sponsored a study some  
5 years ago; that is, my division sponsored a study some  
6 years ago that was conducted on our behalf at Bio  
7 Research Laboratories in Montreal to examine the  
8 question of bio-equivalency on our behalf so that we  
9 might be able to endeavor to answer this question that  
10 you have asked.

11 And it seems to me that this study was  
12 done for us about, must be about four years ago now.  
13 This was a sub-chronic study in which we examined a  
14 number of critical toxicological parameters in order to  
15 be able to answer the question as to whether or not the  
16 acid or amine were treated differently by the body upon  
17 entry.

18 The conclusion that we reached from this  
19 study was that there was no difference which we could  
20 detect in the way in which either one of these two  
21 forms of 2,4-D were handled and that was, to some  
22 extent, the basis for our arriving at the conclusion  
23 that there was biological equivalency between the  
24 various forms of 2,4-D once it entered the body, and  
25 that the form in which it was actually used would be



1 expected to affect primarily the rate at which the  
2 chemical may penetrate the skin, but not the way in  
3 which the chemical would be handled by the body once it  
4 had entered.

5 To the extent that these various  
6 formulations may affect the rate at which the chemical  
7 enters the body, we would expect from substantial  
8 experience in this area that the exposure studies  
9 themselves would address that question entirely.

10 So, in our view, the combination of  
11 exposure studies carried out on the end use  
12 formulation, regardless of what form of 2,4-D is used,  
13 together with toxicological studies conducted on the  
14 acid, provide a relatively full picture of likely  
15 outcome.

16 Q. Now, you have referred to a number of  
17 studies. The one I'm interested in is the one that you  
18 relied upon to conclude you would not normally need to  
19 do tests on the amines and esters, and that was a study  
20 that you sponsored -- sorry, Health and Welfare  
21 sponsored?

22 A. That's correct.

23 Q. Could you provide a copy of that  
24 report to this Board?

25 A. I think I could. Actually I think

1 that would be accessible. It is accessible. Yes, I  
2 could. I apologize in that we have never published it,  
3 we've had the best of intentions, but...

4 Q. That's fine.

5 A. Yes, we will do that.

6 Q. Dr. Ritter, just for the record,  
7 sorry, I will wait until you are finished writing.

8 A. Go ahead.

9 Q. Just for the record, are you aware of  
10 what form 2,4-D is applied in the forests of Ontario?

11 A. Not directly. Maybe the ester or the  
12 amine, I would expect.

13 Q. But you don't know?

14 A. Not for sure.

15 Q. Okay. Are you also aware, Dr.  
16 Ritter, of a 1989 -- or an article published in the  
17 1989 Edition of Teratology by a number of doctors from  
18 Saskatchewan or I think they are veterinarians from  
19 Saskatchewan on 2,4-D and picloram which found birth  
20 defects in the offspring of mice following exposure of  
21 the product to male mice only. It's the Blakely study.

22 A. Yes, that's a dominant lethal study  
23 that you are referring to, it's not really designed to  
24 address the end point that you are implying.

25 Q. Well --

1 A. Male dominated effects --

2 Q. Well, do you have a copy of the  
3 article?

4 A. No, I don't.

5 MS. MURPHY: Have you got a copy of the  
6 article, Mr. Castrilli?

7 MR. CASTRILLI: I provided it to you.

8 DR. RITTER: Oh.

9 MR. CASTRILLI: The Effects of Paternal  
10 Subacute Exposure to Tordon 202c on Fetal Growth and  
11 Development in CD-1 Mice.

12 MS. MURPHY: No.

13 DR. RITTER: You said you provided that  
14 study?

15 MS. MURPHY: No, you have not provided  
16 that one to us, Mr. Castrilli.

17 DR. RITTER: No, I don't recall having  
18 seen that one, Mr. Castrilli.

19 MR. CASTRILLI: All right. I will make  
20 it available to the witness now and I will deal with it  
21 at the end of today, if it's possible.

22 THE CHAIRMAN: Is it a lengthy study?

23 MR. CASTRILLI: No, it's just seven  
24 pages.

25 MS. MURPHY: It is Document No. 40 I

1 think at this time that he has been provided to the  
2 witness.

3 MR. CASTRILLI: It's only because nothing  
4 was provided to anyone in-chief.

5 I will just provide it to the witness now  
6 and he can have the lunch break to look at it and we  
7 will talk about it this afternoon. (handed)

8 THE CHAIRMAN: If you have had an  
9 opportunity over the lunch hour, Dr. Ritter, to review  
10 that document, fine; if not, advise the Board, we will  
11 deal with that when you return in a couple of weeks.

12 DR. RITTER: Thank you.

13 THE CHAIRMAN: Are you planning to admit  
14 that at this time?

15 MR. CASTRILLI: No, I think perhaps we  
16 might just reserve a number for it.

17 THE CHAIRMAN: Exhibit 752.

18 ---EXHIBIT NO. 752: Excerpts of article entitled: The  
19 (reserved) Effects of Paternal Subacute  
20 Exposure to Tordon 202c on Fetal  
21 Growth and Development in CD-1  
22 Mice, P. M. Blakley, et al.

23 MR. CASTRILLI: Sorry, Mr. Chairman, that  
24 would be exhibit number...?

25 THE CHAIRMAN: 752.

MR. CASTRILLI: 752. Mr. Chairman, I  
might as well just simply hand them out for now and we



1 won't discuss them now. (handed)

2 THE CHAIRMAN: Thank you.

3 DR. RITTER: Mr. Chairman, I wonder if  
4 this might be a useful time for me just to endeavor to  
5 answer a question that Mr. Castrilli put to me  
6 yesterday?

7 THE CHAIRMAN: Just hold on until we  
8 handle this document.

9 THE CHAIRMAN: Very well, do you want to  
10 deal with this matter?

11 DR. RITTER: Mr. Castrilli, you asked  
12 yesterday when we were discussing the Haganmaier report  
13 if I had any written confirmation as to what had  
14 occurred. I do and I have it available now. It's in  
15 the form of a fax. I requested it from my office and  
16 it's -- pursuant to the Privacy Act I have removed the  
17 name of the individual to whom this was sent, but it's  
18 a letter in which our discussions with Dr. Haganmaier  
19 of the Germany and the results of those discussions are  
20 detailed.

21 I'm quite delighted to make that  
22 available.

23 MR. CASTRILLI: I'm content. Sorry.

24 THE CHAIRMAN: Sorry. I think we should  
25 probably admit that.

1 MR. CASTRILLI: Do you have copies of it  
2 yet?

3 DR. RITTER: No, I have one fax.

4 MR. CASTRILLI: All right. Perhaps, Mr.  
5 Chairman, we can simply reserve a number for it now and  
6 at the appropriate time it can be filed.

7 THE CHAIRMAN: Okay. Exhibit 753.

8 ---EXHIBIT NO. 753: Fax of letter from F. Y. Chang to  
9 (reserved) unnamed on the status of Dr.  
10 Haganmaier's work dated March 22,  
11 1989.

11 THE CHAIRMAN: And how can we describe  
12 that document, Dr. Ritter?

13 MS. MURPHY: Is there a date on the  
14 letter?

15 DR. RITTER: There is a date on the  
16 letter, it's March 22nd, 1989. It was in response to  
17 the question which Mr. Castrilli put to me on the  
18 Haganmaier work.

19 MS. MURPHY: Perhaps just identify it by  
20 the name of the person who wrote the letter, letter  
21 from...?

22 DR. RITTER: Letter from F. Y. Chang to  
23 unnamed on the status of the Haganmaier work.

24 MS. MURPHY: Dated March 22nd, 1989.

25 DR. RITTER: That's correct.

1 THE CHAIRMAN: Thank you.

2 MR. CASTRILLI: Q. Dr. Ritter, can you  
3 confirm that -- I am sorry, let me just ask you to  
4 return to page 85 of Exhibit 748.

5 DR. RITTER: A. Yes.

6 Q. We are now looking at the heading  
7 under chronic -- excuse me, chronic testing for  
8 oncogenicity.

9 A. Yes.

10 Q. Can you confirm that U.S. EPA only  
11 has or has only partially -- has data that only  
12 partially fulfills its requirements with respect to the  
13 oncogenic or tumor-causing potential of 2,4-D acids and  
14 has no data with respect to the oncogenic or  
15 tumor-causing potential of the 2,4-D esters and amines?

16 A. That is what this page indicates.

17 Q. Is that the situation in Canada as  
18 well?

19 A. We have not requested information on  
20 the amines or the esters, consequently, it can't be  
21 considered lacking.

22 Q. And the reason is the same as the one  
23 you gave before.

24 A. Biological equivalence.

25 Q. And is it also true that you only --

1 or excuse me, do you also agree that the situation with  
2 respect to the acids is that you only have data that  
3 partially fulfills those requirements?

4 MS. MURPHY: Which requirements are you  
5 talking about?

6 MR. CASTRILLI: Still talking about  
7 oncogenicity.

8 MS. MURPHY: No, you are talking about  
9 EPA requirements? You are asking the witness if he has  
10 information about those EPA requirements?

11 MR. CASTRILLI: With all due respect, Ms.  
12 Murphy, the question is extremely simple.

13 Q. Does Canada only have data that  
14 partially fulfills its requirements with respect to the  
15 oncogenicity of 2,4-D acids?

16 DR. RITTER: A. I may be in a better  
17 position to answer that question definitively in the  
18 near future. The reason why I'm hedging to give you an  
19 absolute answer is because the adequacy of the studies  
20 available to us is in review and I'm unable to give you  
21 a definitive answer at this time as to whether they are  
22 or are not considered to be absolute in the sense of  
23 satisfying the requirements.

24 We certainly have cancer testing in two  
25 species for the acid and both of these studies have

1       been conducted to very contemporary protocols and in a  
2       rather exhaustive fashion. As to whether or not they  
3       will absolutely satisfy the requirement, I simply can't  
4       answer that question today. Not based on any  
5       proprietary consideration at all, but simply because  
6       the biology of that response is in review right now.

7                   Q. In looking at page 85, Dr. Ritter, we  
8       see that on the right-hand side of the page the agency  
9       has a reserved -- or an indication as to whether the  
10      data must be submitted or whether additional data must  
11      be submitted, they note: Reserved.

12                   And I would just like to take you to  
13      footnote 12 which is with respect to that reservation.  
14      It's on page 88.

15                   A. Yes.

16                   Q. Do you have that page?

17                   A. Yes.

18                   Q. The reservation indicates that:  
19      Whether the additional data must be submitted is  
20      dependent upon independent evaluation of all kidney  
21      slides from the relevant chronic and sub-chronic  
22      studies. Is that the same exercise that Canada is now  
23      going through?

24                   A. Yes.

25                   Q. That is what you are waiting to



1 determine?

2 A. The slides are in our hands right  
3 now.

4 Q. Okay. Can you give us an indication  
5 of when that review may be complete and you may be able  
6 to provide an answer as to whether -- or what further  
7 steps may be necessary?

8 A. It's very difficult to do that  
9 because what -- how long it will take before I can  
10 answer the question will depend on the outcome of the  
11 review which is underway. It could be -- well, I  
12 shouldn't really say any more.

13 It's difficult to tell you that when I  
14 don't know what the outcome of the present review will  
15 be.

16 Q. Are we talking months or are we  
17 talking years?

18 A. You could be talking either, it  
19 depends on the outcome of the present review.

20 Q. This is a product that was registered  
21 for the first time in Canada in what decade?

22 A. Approximately 1940.

23 Q. Thank you.

24 A. I should perhaps add for the Board,  
25 Mr. Castrilli, that although those reviews are

1 currently pending, our evaluation of the available data  
2 like that done in the United States does not suggest  
3 that the continued use of 2,4-D at this time  
4 constitutes a hazard. That is exactly the conclusion  
5 which the Americans have reached in this document, in  
6 Exhibit 748, and it's precisely the conclusion that we  
7 have reached at this time in Canada.

8 So while these reviews are pending and  
9 are underway, the evidence that we do have does not  
10 suggest to us that continued use during this period of  
11 evaluation and review constitutes an unacceptable  
12 hazard.

13 THE CHAIRMAN: Dr. Ritter, I'm having a  
14 little difficulty with the chronology of the approval  
15 process. As I understand it - and correct me, please,  
16 if I'm wrong - a product is -- registration is applied  
17 for at a particular point in time, the agency reviews  
18 all existing data and/or requests additional data in  
19 terms of the package, makes a determination based on  
20 the available data at that time and registers the  
21 product, if it deems the data to be sufficient and the  
22 results of the various tests to be constituting no  
23 hazard to human health or the environment, effectively  
24 is that--

25 DR. RITTER: Precisely.

1 THE CHAIRMAN: --where we are? Now,  
2 having said that, a product that is registered in the  
3 40s or the 50s obviously wouldn't at that point in time  
4 have as stringent requirements as may be required today  
5 or in a later decade.

6 DR. RITTER: That's correct.

7 THE CHAIRMAN: The standards and the  
8 requirements are changing as scientific knowledge  
9 becomes more specific and more detailed and the  
10 regulatory system is either reformed or matures. Is  
11 that sort of a general overview?

12 DR. RITTER: It's better than a general  
13 overview, it's absolutely correct.

14 THE CHAIRMAN: Well, notwithstanding that  
15 a product is registered and may be registered 30 or 40  
16 years ago, is it not the standard practice that ongoing  
17 studies are more or less continuous if the agency feels  
18 that any outstanding questions because of increased  
19 state of knowledge exists or observations are made of  
20 some kind of negative effect that should be  
21 investigated, so you have a series of ongoing studies  
22 continuing more or less continuously if the agency has  
23 any suspicions that more data is necessary?

24 DR. RITTER: It's done certainly in the  
25 way in which you have described, but it's also done

1 even if there isn't an overt suspicion.

2 THE CHAIRMAN: As monitoring aspect?

3 DR. RITTER: Just as a process of  
4 bringing older databases to more contemporary  
5 standards, even in the absence of any specific concern.

6 THE CHAIRMAN: Okay. Now, at any point  
7 in that process after registration, the product is out  
8 in the field, if there is anything that arises that  
9 suggests to the agency that there is a health problem  
10 either to humans or the environment, does the agency at  
11 that point in time have the power to immediately, if it  
12 feels it's a serious problem, suspend the use of the  
13 product until that problem is overcome--

14 DR. RITTER: Yes.

15 THE CHAIRMAN: --to the agency's  
16 satisfaction? Or if it doesn't feel that it is that  
17 much of a problem but it is an investigation that  
18 should nevertheless be conducted, order further  
19 studies?

20 DR. RITTER: Both, yes.

21 THE CHAIRMAN: Both. And so that the  
22 fact that data is under review, is it the position of  
23 the Department that that in no way affects the validity  
24 of the registration in terms of safety in the use of  
25 the product until such time as the agency takes some

1 further action?

2 DR. RITTER: That's correct.

3 THE CHAIRMAN: Such as suspending the  
4 registration, revoking it, or requiring further data,  
5 et cetera?

6 DR. RITTER: That's correct. In the case  
7 of older compounds, what you have just said is  
8 absolutely correct and very precise.

9 What it's taken to mean is that in the  
10 case of older compounds, the absence of a particular  
11 study which may not have been required at the time that  
12 the compound was registered, in itself does not impute  
13 a hazard. There would be no scientific defensible  
14 basis on which to eliminate a product because a study  
15 is absent.

16 So rather than, in many cases, removing  
17 these products from the market, the position that the  
18 world has come to - because the position that you've  
19 just described, the philosophy that you've just  
20 described is most certainly not unique to Canada - the  
21 position that's been adopted globally and  
22 internationally by international umbrella agencies such  
23 as the World Health Organization, is that in those  
24 cases the petitioner should be given an opportunity to  
25 carry out the necessary studies, submit them for



1 evaluation and, if adverse effects are noted,  
2 appropriate action is then taken.

3 And in the Canadian context there are  
4 some very notable examples in the last four or five  
5 years where precisely such action has been taken. I  
6 would refer you perhaps to the Alachlor decision.

7 Alachlor -- 2,4-D, rather, is a very good  
8 example of that philosophy exactly. It's a compound  
9 which has been registered for many, many years and, as  
10 you've noted in the general case, many of the studies  
11 which we are reviewing today were not a requirement at  
12 the time that 2,4-D was registered. They are  
13 requirements now and, consequently, we are requiring  
14 that these studies be conducted by the industry task  
15 force and that they be submitted.

16 There is no question that if any of these  
17 studies suggested an adverse effect we would take  
18 whatever action we thought appropriate based on the  
19 outcome of the study.

20 THE CHAIRMAN: Okay. And one  
21 supplementary question. Is there any type of study  
22 that is required today that you would consider pivotal  
23 to registration in the sense that, if it wasn't a  
24 requirement in earlier decades -- in earlier decades  
25 the product might have been registered, but if that

1 kind of study is not done today, you wouldn't register  
2 the product?

3 In other words, is there a definitive  
4 type of study that may not have caught earlier  
5 registrations?

6 DR. RITTER: There are a number.  
7 Certainly, the core studies that I've described in my  
8 formal presentation we generally regard to be important  
9 to an overall evaluation of potential hazard. It is  
10 very difficult to attach more or less weight to an  
11 individual component of that list, but we certainly  
12 regard that list in its overall context to be important  
13 in an evaluation.

14 THE CHAIRMAN: And in the case of  
15 products that would have been registered prior to that  
16 set of studies that are required today, are you  
17 confident that the monitoring of earlier registered  
18 products would be sufficient to identify any problems  
19 to health and safety?

20 DR. RITTER: Could you just ask that  
21 again?

22 THE CHAIRMAN: Okay. Obviously the  
23 agency has decided that certain tests are now required  
24 for registration. If you are looking at an earlier  
25 product that was registered prior to some of these

1 tests being required, would, in your opinion, the  
2 monitoring of those earlier registered products be  
3 sufficient to identify any adverse human health or  
4 environmental effects, notwithstanding that these new  
5 sets of tests that you require today would not yet have  
6 been done?

7 DR. RITTER: When you use the term  
8 monitoring, you are referring to human monitoring in  
9 the field?

10 THE CHAIRMAN: Human monitoring and/or  
11 environmental monitoring, like monitoring for impacts  
12 to both the human and natural environment.

13 DR. RITTER: I don't think human  
14 monitoring would in itself necessarily be wholly  
15 satisfactory as a substitute for these studies until  
16 such time that they're completed which is, in part, why  
17 we created both the formal re-evaluation process and  
18 the ad hoc re-evaluation process in order that we could  
19 bring these chemicals into this cycle on a regular  
20 predetermined basis.

21 It's the combination of those variables I  
22 think that gives us some confidence in that there is  
23 some measure of accountability, if you like. But I  
24 don't know that I would assign absolute confidence to  
25 any one of those variables in the overall scheme.

1                   The Canadian Farm Operator Mortality  
2     Study, which I only very briefly introduced the other  
3     day, as I indicated, is the largest investigation of  
4     agricultural workers ever undertaken in the world and  
5     our primary impetus for initiating that study was in  
6     our attempt to answer the very question that you've  
7     asked.

8                   If it's reasonable to anticipate that  
9     farmers will be exposed to more pesticides more often  
10    and at higher volumes than anyone else, and we believe  
11    that's a reasonable hypothesis, we thought this was a  
12    good place to initiate an examination of risks in  
13    association with agricultural chemicals in that if we  
14    couldn't identify significant risks in that group, it  
15    was unlikely that we would identify risks in groups  
16    that are exposed less frequently to fewer chemicals.

17                  What prompted us to initiate that  
18    investigation, as I say, is that we were very concerned  
19    in attempting to answer the very question you asked, is  
20    there actual human epidemiologic evidence that suggests  
21    in a very high risk group -- I should say, a very high  
22    potential risk group is indeed at risk.

23                  And hopefully when that study is complete  
24    and, as I indicated, we are doing it on a  
25    province-by-province basis, we will be in a better



1 position to answer that very question.

2 THE CHAIRMAN: Okay. Thank you.

3 MR. MARTEL: Are the workers producing  
4 that not at worse risk?

5 DR. RITTER: Are the workers producing --  
6 no. Generally speaking, particularly in contemporary  
7 times, workers are at much less risk because of the  
8 practice of industrial hygiene.

9 However good or bad industrial hygiene  
10 may be in Canada or elsewhere, I think I would have to  
11 argue that it is worse on the farm because there is no  
12 legislated control at the farm gate; whereas there is  
13 in an industrial setting. Now, we could debate as to  
14 the efficiency of those legislated controls in the  
15 industrial setting, but there can be no debate that  
16 there are none at the farm gate.

17 So that, however, little confidence one  
18 may have, as I say, in an industrial setting, I think  
19 one should have greater confidence in that setting than  
20 one would at the farm gate. And, consequently, I think  
21 our view is that agricultural workers as a cohort, as a  
22 sub-population have somewhat unique opportunities for  
23 exaggerated exposure to pesticides.

24 MR. CASTRILLI: Q. Dr. Ritter, during  
25 the course of your answers to the Chairman you said



1       that the core studies you had identified in your  
2       testimony-in-chief would be the important ones to  
3       consider in response to the Chairman's question.

4                   Can I take it that the core studies would  
5       include mutagenicity, oncogenicity, chronic testing,  
6       teratology, multi-generation?

7                   DR. RITTER:   A.   Yes.

8                   Q.   Would it include any others?

9                   A.   It would include exposure studies, it  
10       would include accute studies.   There would be other  
11       which we would include in there as well, pharmacology.

12                  Q.   Is it for variation of metabolism?

13                  A.   Yes.

14                  Q.   Okay.   Dr. Ritter, you have probably  
15       noticed in Exhibit 748, particularly the tables that --  
16       where the U.S. EPA indicates it has -- either has  
17       information or it doesn't have information, it has a  
18       column called Bibliographic Citation.

19                  MR. CASTRILLI:   And, Mr. Chairman, I now  
20       see that I probably should have provided the entirety  
21       of this document and I will in fact do that and ask  
22       that it be substituted for the one that is currently  
23       Exhibit 748, but I think I can ask the questions for  
24       the moment without actually having the full document  
25       before us.

1 Q. Dr. Ritter, you will notice, for  
2 example, at page 85 where the agency indicates, for  
3 example, that it has a document. There is in fact a  
4 series of numbers under the heading Bibliographic  
5 Citation and I think you're in a position to confirm,  
6 since you have the entire document before you, that in  
7 fact that citation is contained in the registration  
8 document itself; is that right?

9 DR. RITTER: A. Yes, it is.

10 Q. I am wondering if you would be in a  
11 position to advise the Board - not necessarily now  
12 obviously - whether for the following categories, which  
13 I will mention in a moment, Canada has additional  
14 studies to the ones that are referred to in U.S. EPA  
15 that Canada is relying upon for the registration?

16 A. No. In fact I think, Mr. Castrilli,  
17 I can save you the effort of asking the question. I  
18 think it's unlikely that I will be able to answer it  
19 for you.

20 Q. Why is that?

21 A. Again, for the same proprietary  
22 considerations that we've discussed before.

23 Q. You cannot tell me whether you have  
24 additional data that supports the testing requirement  
25 in relation to an area?

1 MS. MURPHY: Let's also just be practical  
2 for a minute. We have no idea how long this list of  
3 bibliography is, we don't know if the bibliography  
4 actually lists everything EPA has.

5 How the witness is supposed to take an  
6 unknown length of paper and make some kind of analysis  
7 between that and everything that he has in his library,  
8 whatever the status of it is, as a practical matter,  
9 seems to me unworthy of the effort.

10 MR. CASTRILLI: Ms. Murphy, with all due  
11 respect, some things may be unworthy, this is not one  
12 of them.

13 Mr. Chairman, if you would look at the  
14 page that I am referring to, just as an example, you  
15 will see that the bibliographic reference, for example,  
16 for chronic testing is one number. That is -- I can  
17 tell you, even though you don't have the full document  
18 before you, the one number refers to one study.

19 In the case of teratogenicity, for  
20 example, under rat there are two numbers. That refers  
21 to two studies.

22 So it seems to me it would be a fairly  
23 simple matter for Dr. Ritter to indicate whether for  
24 the five -- six areas I am going to ask him, whether  
25 Canada (a) has the studies that are listed by U.S. EPA

1 in a public document; and, (b) whether Canada has  
2 additional studies that support the registration in  
3 relation to that area.

4 He is the only one in the country, apart  
5 from anyone else in his division, who can possibly  
6 answer that question to this Board's satisfaction. And  
7 I would submit that that is the kind of information  
8 this Board has to have in addition to other matters I  
9 will be raising. Otherwise this exercise truly itself  
10 acting and operating in a vacuum.

11 DR. RITTER: Mr. Castrilli, I'm not  
12 trying to impede your cross-examination in any way,  
13 what I am trying to suggest to you is - I'm not a  
14 lawyer, you are - as you know, disclosure of third  
15 party information, as to whether or not that  
16 constitutes an offence, is really based on the use to  
17 which that information can subsequently be put.

18 It's very difficult for me, in fact it's  
19 impossible for me to offer a legal opinion as to  
20 whether or not the disclosure of the list of studies  
21 which we have would somehow or another violate the  
22 principle of that confidentiality.

23 But I have been instructed that it may  
24 and that it may compromise the competitive positions of  
25 the companies involved.



1                   Consequently, I cannot offer you any  
2                   argument as to whether or not the studies would or  
3                   would not be useful to you, but I can tell you that I'm  
4                   not in a position to indicate to you what studies I  
5                   have, and that if you require that information I would  
6                   suggest that you direct the question to the  
7                   registration authority, the Minister of Agriculture.

8                   And if that department makes the  
9                   determination that they have no difficulty in  
10                  disclosing that list to you, I certainly have no  
11                  problem with it whatsoever. This is not a question of  
12                  science, Mr. Castrilli, it's a question of law and I'm  
13                  simply not in a position to deal with it.

14                  MR. CASTRILLI: Well, Let's just deal  
15                  with this in two parts.

16                  MS. MURPHY: Well, let's just deal with  
17                  the one part.

18                  THE CHAIRMAN: Just a moment, Mr.  
19                  Castrilli. Apart from advising the Board as to what  
20                  studies you have which may be the same as or additional  
21                  to what the EPA has disclosed in this document, are you  
22                  in a position to indicate that Canada has additional  
23                  studies to what is listed here, not indicating what  
24                  they are or even what category they fall under?

25                  DR. RITTER: Yes.



1 THE CHAIRMAN: Can you go that far?

2 DR. RITTER: Yes.

3 THE CHAIRMAN: So Canada relies on more,  
4 in your opinion or knowledge, than what is disclosed in  
5 here?

6 DR. RITTER: We may. It would depend on  
7 the individual study case, but there may be more  
8 available to us than there may be in the United States.

9 THE CHAIRMAN: Okay. Apart from that,  
10 Mr. Castrilli, I think the whole issue as to what  
11 should be produced or should not be produced is going  
12 to be a matter of legal argument and, since it involves  
13 a fairly important issue of proprietary information,  
14 the Board is not going to order anything until it has  
15 heard full argument from all parties concerned,  
16 including the agencies involved.

17 MR. CASTRILLI: Mr. Chairman, let's do  
18 this, as I said, one step at a time.

19 It's clear Dr. Ritter has already  
20 indicated that he can tell you - what I would have  
21 thought was self-evident, without violating any alleged  
22 code of confidentiality - as to whether Canada has more  
23 information than EPA has.

24 It's not a question of identifying  
25 anything other than to say: Yes, we have more and it

1 meets our requirements, period.

2 THE CHAIRMAN: Well, I think he has just  
3 done that.

4 MR. CASTRILLI: Well then, I presume he  
5 has agreed to provide that information. But what he  
6 hasn't -- what I haven't yet told you is which  
7 information -- which categories of study I want it for,  
8 and I'd like to do that.

9 THE CHAIRMAN: Well, this is an area that  
10 I think may be dealing with a proprietary issue as to  
11 whether or not there is more information available in  
12 terms of registration with respect to certain  
13 categories.

14 He has told you in general, without  
15 identifying which category, that Canada may in fact  
16 rely on additional information.

17 MR. CASTRILLI: Well, let me put on the  
18 record the areas, so that at least we know what we are  
19 talking about.

20 Q. Dr. Ritter, for ease of reference I  
21 am referring to your Exhibit 709, page E?

22 DR. RITTER: A. 709 you said?

23 Q. 709. It would be the hard copy of  
24 your overheads.

25 A. Yes.

1 Q. It is the heading Long-term and  
2 Special Tests Required for Registration?

3 A. Yes.

4 Q. There are seven categories there.  
5 Those are the seven categories that I'm referring to.

6 A. I think I have already answered your  
7 question in part, Mr. Castrilli. I've indicated to you  
8 that we do have pharmacokinetic studies,  
9 pharmacokinetic data which the American report has  
10 already suggested they did not have.

11 I can't give you a great deal more than  
12 to tell you that we most definitely have metabolism  
13 data which was not cited in the U.S. position document.

14 Q. Okay. Well, for the other  
15 categories, without asking you to try and do it now --

16 A. No, I can do it now and I'd prefer to  
17 do it now. With regards to mutagenicity, as has  
18 already been referenced by a number of other sources  
19 including the Ontario Task Force convened by the  
20 Minister of the Environment, there are mutagenicity  
21 data available which were not cited in the U.S.  
22 position document.

23 Q. That Canada relies upon?

24 A. Which Canada used in its overall  
25 assessment, yes.

1 Q. Well, hold on a minute. Used in its  
2 overall assessment. Was the data satisfactory or not?

3 A. Mr. Castrilli, you're using an  
4 American term to ask a question in the Canadian  
5 context. Canada does not have strict regulations as to  
6 protocol requirements for a given study, so that it's  
7 very difficult in the abstract sense to answer as to  
8 whether or not a study has satisfied requirements  
9 because the requirements are not established like they  
10 are in the United States.

11 Canada relies very heavily on judgment in  
12 the interpretation of the study rather than in formal  
13 established protocol.

14 If you were to look, for example, at the  
15 United States regulations for conduct of an  
16 oncogenicity study, it might indicate that the study be  
17 conducted in no less than 50 animals per sex per group,  
18 and if the study were conducted in 47 animals it would  
19 probably be rejected as not having satisfied the study  
20 protocol. Such a study would not be rejected in Canada  
21 simply because it was three short of the target number  
22 of animals.

23 So it's very difficult for me to answer  
24 your question in a very precise sense. I would like to  
25 tell you that there are mutagenicity data which we

1       relied on in our overall assessment.  Where that  
2       mutagenicity data was considered to be inappropriate,  
3       we obviously didn't use it; and where it was considered  
4       to be appropriate we did use it, and I can't tell you  
5       which studies we did and we did not use today or, I  
6       suspect, at any subsequent time.

7                   THE CHAIRMAN:  And, Dr. Ritter, I guess  
8       we can assume that the studies were satisfactory in the  
9       sense that had they produced data which alarmed the  
10      department in any way, you would have taken further  
11      action?

12                  DR. RITTER:  That's correct.

13                  THE CHAIRMAN:  Such as deregistering the  
14      product or demanding something further immediately or  
15      something like that?

16                  DR. RITTER:  Yes.

17                  THE CHAIRMAN:  So from that point of view  
18      they were satisfactory?

19                  DR. RITTER:  That's correct.  For  
20      example, in the context, Mr. Chairman, of the chronic  
21      feeding and the oncogenicity studies, we have requested  
22      additional information to assist us in our  
23      interpretation of those studies.

24                  Some of the information which we are  
25      discussing with the industry task force, to the best of



1 my knowledge, has not been required by the  
2 Environmental Protection Agency. Again, I can't  
3 elaborate on the nature of those discussions or the  
4 additional data which is being requested, but I can  
5 tell you that, to the best of my knowledge, it has not  
6 been requested in the United States.

7 We have a number of worker exposure  
8 studies which the Americans may or may not have used in  
9 their evaluation. In fact, I'm not even sure that they  
10 would have had them, but were certainly available to  
11 us, particularly in the forest context. And I  
12 emphasize that because I would say that the studies  
13 with the greatest precision -- the worker exposure  
14 studies with the greatest precision have in fact been  
15 conducted in the forest scenario.

16 MR. MARTEL: Can I ask a question that  
17 bothers me? While we are testing all of this and we  
18 hear about information being confidential, why should  
19 the public, who might be subjected to exposure to these  
20 substances, be kept in the dark as to what in the hell  
21 is going on?

22 I understand the - and I have heard it  
23 for years - about the confidentiality and how it  
24 might -- you have a patent that protects your rights,  
25 as I understand it, so that nobody can steal your

1 formula, and yet you have studies going on regarding  
2 peoples' health, the possibility - I'm not saying that  
3 they do or they don't - but it does involve the public.

4 Why is it that the public should be  
5 excluded from all of this ballgame?

6 MS. MURPHY: In fairness to the witness,  
7 what you are asking him is a question of law, Mr.  
8 Martel.

9 MR. MARTEL: He might have an opinion  
10 that he might want to give me.

11 MS. MURPHY: If I can just finish my  
12 sentence. In fact, I was going to comment about a  
13 comment, a similar one, made by Mr. Castrilli.

14 Mr. Castrilli alleged to -- referred to  
15 the alleged code of confidentiality and I would just  
16 point out there is nothing alleged about this, this is  
17 Federal Statute Law. There is nothing alleged about  
18 it, it is a real thing that this witness cannot do  
19 anything about one way or another and nor can anyone  
20 else in this room.

21 MR. MARTEL: I understand that, Ms.  
22 Murphy, and that's not the question that I am asking.  
23 I am asking him a personal opinion.

24 I understand the law. The thing that  
25 amazes me about it, always has, is that the very people

1 who are exposed to these things are in fact the people  
2 quite frequently who are not allowed the information.

3 I guess I'm asking him a personal opinion  
4 if he thinks that's right. I mean, I find it  
5 difficult. And, as I say, I understand the law.

6 DR. RITTER: Mr. Martel, as I appear here  
7 as an officer of the Department of National Health and  
8 Welfare I'm not going to offer you a personal opinion,  
9 but I am going to offer you two views on your question  
10 which are a matter of record.

11 The first is that the public concern and  
12 the public appetite for information on these matters is  
13 evident and it's one of the central issues that Mr.  
14 LeBlond is examining in the federal review currently  
15 underway; that is, access to information and the ways  
16 by which this kind of access could be provided and  
17 still safeguard the legitimate rights of the people who  
18 have generated the information.

19 The second point, just as a matter of  
20 clarification for your own interest really, is that the  
21 issue of patent protection is not really the issue here  
22 with disclosure of the information at all, because the  
23 studies are actually not protected by patent.

24 MR. MARTEL: But the product is.

25 DR. RITTER: The product is. But the

1 reason why there has been sensitivity about the release  
2 of studies historically, not only in this context I  
3 might add but in many, many other areas as well, is  
4 because information about the outcome of a given study  
5 on a given product would most certainly affect the way  
6 in which competitors would view the market potential of  
7 that product. It would also provide tremendous  
8 opportunity for competitors in terms of their own  
9 research and development on products which they may be  
10 considering at the time.

11 I'm not offering you an argument as to  
12 whether that's a good reason or a bad reason, I'm  
13 simply telling you that that is the reason.

14 If, for example, I were a manufacturer of  
15 a pesticide and I carried out a study with compound "x"  
16 and it showed all kinds of adverse effects. If I were  
17 a manufacturer developing a structural analogue of that  
18 compound I would, in all likelihood, abandon  
19 development of that compound once it became evident to  
20 me that it were likely to produce adverse effects, but  
21 had I not had that information I probably would have  
22 spent \$10-million to find that out.

23 Having had that information beforehand, I  
24 save myself five, maybe eight years of work and  
25 probably \$10-million.



1                   So I think there is a very real and  
2                   legitimate concern that general access to these kinds  
3                   of studies may affect - I think the words that are used  
4                   in the regulations are - the competitive rights of the  
5                   businesses involved.

6                   But I offer no more opinion on that but  
7                   simply to say that that is the reason and that the  
8                   LeBlond Commission is examining that. I would say it's  
9                   probably -- they consider it to be one of their number  
10                  one priorities.

11                  MR. CASTRILLI: Mr. Chairman, I was going  
12                  to make a suggestion which might shorten this up  
13                  considerably because I don't want to take Dr. Ritter  
14                  through a torturous process of instant recall with  
15                  respect to a matter of this consequence.

16                  I'm wondering if I could ask Dr. Ritter  
17                  to prepare a chart, not unlike the one we see in Table  
18                  A of Exhibit 748, just with respect to the chronic  
19                  studies found in his Exhibit 709 and he can revise the  
20                  categories as he sees fit.

21                  If Canada doesn't have requirements but  
22                  it uses judgment in determining whether it has adequate  
23                  data or not, he can use that heading, it meets Canada's  
24                  requirements from a judgmental standpoint.

25                  I simply want in one place an indication



1 comparable to this one as to what the situation is in  
2 Canada, and I don't think that's an unreasonable  
3 request and there is no one else who could do that.

4 THE CHAIRMAN: Well, Dr. Ritter will have  
5 to discuss this with his counsel for the Department  
6 and/or counsel for the Ministry and advise whether or  
7 not he feels he will be in a position to do that.

8 MS. MURPHY: I think the point is that  
9 Dr. Ritter, as I understand it, has already said it, he  
10 has already given the information, he has given the  
11 information viva voce right now, and asking him to go  
12 and make it pretty and put it on a chart is not an  
13 exercise that's useful.

14 MR. CASTRILLI: With all due respect,  
15 some agencies seem to think it is and I'm suggesting  
16 that this Board in making a determination as to whether  
17 to permit this product to be used in the Crown forests  
18 of Ontario ought to have the best information  
19 available.

20 I am not asking for confidential  
21 information, I am asking for a chart that tells us what  
22 the situation is in Canada just the way we have a chart  
23 which tells us, at a glance, what the situation is in  
24 the U.S. That is not an unreasonable request and no  
25 one else can do it.

1                   THE CHAIRMAN: Well, it may or may not be  
2 revealing confidential information. Before the Board  
3 will consider ordering Dr. Ritter to do any such thing,  
4 Mr. Castrilli, he will be afforded the opportunity of  
5 consulting with his counsel, with the Department of  
6 Agriculture, with whom -- whatever agency he feels is  
7 necessary to consult with and advise the Board as to  
8 whether or not he can reasonably meet your request.

9                   At that point in time the Board may be  
10 prepared to make a decision on this. Failing that, we  
11 will probably end up hearing full legal argument on  
12 what he can and what he cannot do.

13                  MR. CASTRILLI: I am content to have it  
14 work in the manner you've suggested, Mr. Chairman, and  
15 for that reason I can move on to a new area.

16                  THE CHAIRMAN: Well, I think we are going  
17 to take a break at this point to start with.

18                  Ms. Cronk?

19                  MS. CRONK: Thank you. Mr. Chairman,  
20 before Mr. Castrilli moves on, could I, just for  
21 purposes of making sure that the transcript is clear  
22 later, have a clarification through Mr. Castrilli.

23                  Dr. Ritter moved through the list on 709  
24 E and provided his oral answers with respect to some of  
25 the categories, some he did not deal with. Perhaps it

1 would assist the Board and all other counsel if he  
2 could either just finish the list or indicate that he  
3 can or can't.

4 And, secondly, do I understand both the  
5 question and the answers that he gave have been related  
6 strictly to 2,4-D and the existence of studies relating  
7 to that chemical, or all the pesticides we have been  
8 talking about? I think the record should be clear  
9 about that.

10 MR. CASTRILLI: The question is only in  
11 relation to 2,4-D.

12 DR. RITTER: The answer -- I can answer  
13 this in thirty seconds, Mr. Chairman.

14 THE CHAIRMAN: Okay.

15 DR. RITTER: The answer relates  
16 specifically to 2,4-D and those areas that I have  
17 indicated where we have information not cited in the  
18 United States position document on 2,4-D, the  
19 reregistration document, are those areas specifically  
20 where we have information which was not identified in  
21 the position document.

22 Where I have not made that notation, we  
23 do not have information which I would consider to  
24 materially be different from that in the United States.

25 And other than having done what I have

1 just done, Mr. Castrilli, I really don't know what more  
2 I can do for you, except the clerical exercise of  
3 constructing a table based on exactly what I've just  
4 said.

5 Because I will not be able to identify  
6 the studies by name, as I've indicated, so the table  
7 that I would provide to you would say that we have  
8 pharmacology studies which were not identified in the  
9 U.S. position document, and I have already said that;  
10 and that we have mutagenicity studies which were not  
11 identified in the U.S. position document, and I've said  
12 that.

13 But I will be unable to give you a list  
14 in which these studies are identified as to the product  
15 tested, as to the outcome, as to the protocol.

16 So I'm looking for your direction, Mr.  
17 Castrilli, as to what that list would contain other  
18 than what I've already told you.

19 MR. CASTRILLI: Well, we haven't gone  
20 through the remainder of the list, and what I was  
21 trying to do was avoid having to spend the time of the  
22 Board going through that exercise.

23 THE CHAIRMAN: Well, we are only dealing  
24 with another -- you have gone through two of them or  
25 three of them, we are only dealing with another four

1 categories.

2 So if you want to take the 30 seconds now  
3 and deal with the other four topics, maybe we can clear  
4 it up that way.

5 DR. RITTER: In the case of chronic  
6 feeding in the rat, Mr. Castrilli, we have essentially  
7 the information described in the U.S. position  
8 document. In the case of oncogenicity, rat and mouse,  
9 we have essentially the information described in the  
10 U.S. position document. In the case of  
11 pharmacokinetics, we have more information than  
12 described in the U.S. position document. In the case  
13 of mutagenicity, we have more information than  
14 described in the U.S. position document. In the case  
15 of teratology, we have essentially the information  
16 described in the U.S. position document. In the case  
17 of the multi-generation study, we have essentially the  
18 information described in the U.S. position document.  
19 And in the case of the worker exposure studies, we have  
20 a variety of studies including, but not restricted to,  
21 studies which were reviewed in the U.S. position  
22 document; that is, we have a number of additional  
23 studies which, in our view, are pertinent to an  
24 evaluation of worker exposure.

25 We also have studies such as the one



1       which I identified which was conducted on our behalf  
2       which I will make available to the Board. That is not  
3       a proprietary study, it was a study conducted by us and  
4       I will make that available.

5                   MR. CASTRILLI: Fine. Mr. Chairman, I  
6       would like to reserve whether more can be expected of  
7       this witness beyond what he has done, but I don't  
8       propose to make those submissions now.

9                   THE CHAIRMAN: Very well. We will take a  
10      break for 20 minutes.

11                   Thank you.

12      ---Recess taken at 10:08 a.m.

13      ---On resuming at 10:40 a.m.

14                   THE CHAIRMAN: Thank you. Be seated,  
15      please.

16                   MS. MURPHY: With respect to a document  
17      that was referred to this morning and marked -- or an  
18      exhibit number was reserved for it, Exhibit 753, which  
19      was the letter from Dr. Chang dated March 22nd, 1989, I  
20      have copies of that now and if I can distribute those.

21                   And just clarify, I understand on advice  
22      of counsel that you deleted the name of the person who  
23      received that letter; is that correct?

24                   DR. RITTER: That's correct.

25                   MS. MURPHY: And I understand that this

1 was an inquiry from a member of the public and that  
2 pursuant to the Privacy Act the name of the person was  
3 deleted for that reason?

4 (handed)

5 THE CHAIRMAN: Thank you.

6 DR. RITTER: Mr. Chairman, I was given  
7 several homework assignments during the course of  
8 cross-examination by Mr. Castrilli. I'm in a position  
9 to answer at least some of these at this time, if you  
10 think that is a convenient time to do that.

11 THE CHAIRMAN: Any objections?

12 MR. CASTRILLI: (nodding negatively)

13 THE CHAIRMAN: Very well.

14 DR. RITTER: I produced the documentation  
15 with regards to the Haganmaier report but you did ask  
16 as well, Mr. Chairman, if we had communicated that  
17 information in any way to the Americans.

18 The answer is no. I'm advised that  
19 because the report in question did not relate to an  
20 agricultural source of 2,4-D at all but rather to a  
21 laboratory standard which was being investigated for  
22 the purpose of scientific analytical methodology alone,  
23 that we did not consider that advising the Americans of  
24 our experiences in this regard would be very beneficial  
25 to them at all.

1 I was asked as to whether or not there  
2 have been any studies concerning the presence of HCB,  
3 hexachlorobenzene in human tissue in Canada. The  
4 answer is yes, there have been a number of  
5 investigations not restricted to HCB but including HCB  
6 and I will probably have those available for you today  
7 and will make them available as soon as they are  
8 submitted.

9 With regards to the study that I referred  
10 to that was done on our behalf at Bio Research  
11 Laboratories in Montreal, I will at the very least -  
12 it's a lengthy report - and I will, in all likelihood,  
13 not be able to make the report in its entirety  
14 available today because of its length, but I will have  
15 available for you today the summary of that report.

16 You asked, Mr. Castrilli, about MRLs and  
17 ADIs for glyphosate.

18 MS. MURPHY: Before you carry on. Do you  
19 think we could this, Mr. Chairman. I know that you  
20 want to have that marked. Perhaps we could mark the  
21 summary and then provide the bulk of the report to Mr.  
22 Castrilli and determine whether it is necessary to copy  
23 the entire report.

24 MR. CASTRILLI: I'm content to do that,  
25 Mr. Chairman.

1 THE CHAIRMAN: Okay.

2 MS. MURPHY: Sorry.

3 DR. RITTER: We discussed, Mr. Castrilli,  
4 MRLs and ADIs for glyphosate and I'm now in a position  
5 to give you those.

6 As the use of glyphosate in Canada on  
7 agricultural commodities is restricted to preharvest --  
8 to pre-emergent applications, there are no formal MRLs  
9 established in Canada for glyphosate, which means that  
10 residues may be present to levels not in excess of .1  
11 part per million.

12 The ADI for glyphosate in Canada has been  
13 established at .1 milligram per kilogram.

14 MR. CASTRILLI: Q. Is that per day?

15 DR. RITTER: A. That's correct. To put  
16 that number into context for you, Mr. Castrilli, I  
17 would refer you to - I'm sorry - to put that into  
18 context for you, Mr. Castrilli, the conversation that  
19 we had with regards to those residues related to  
20 carcinogenic risk.

21 I would refer you to page 156 of the  
22 Crump report which is Exhibit No. 716. Consumption is  
23 based on a calculation which includes consideration of  
24 the residues present and the anticipated consumption of  
25 that food commodity. The product of that equation

1 gives the overall anticipated exposure.

2 So if you were to take a look, for  
3 example, at Table 156, you will note both the more  
4 reasonable and the worst-case scenarios for exposure to  
5 these various food commodities that may be contaminated  
6 with glyphosate.

7 In all cases you will notice that these  
8 values are well below the levels which I have just  
9 quoted to you and, in all cases, I think you would  
10 agree it would not be expected that these commodities  
11 would be consumed every day for one's entire life and  
12 also at the maximum contaminated level contemplated in  
13 this table.

14 So that the sum conclusion of what I'm  
15 trying to say to you is that all of these values would  
16 fall within the .1 part per million residue limits  
17 presently established in Canada.

18 THE CHAIRMAN: Okay. Dr. Ritter, just  
19 before you go on. The Board would like to know the  
20 answer to the following question, to the best of your  
21 ability to answer it, and; that is:

22 Does your Agency feel that it is in any  
23 way impeded by laws concerning proprietary information  
24 in not having access to studies from other  
25 jurisdictions in order to formulate your assessment of



1 a particular product?

2 In other words, is there a free flow of  
3 information between agencies, between your Agency and  
4 other agencies so that Canada can get its hands on the  
5 most up-to-date studies, recognizing that it would not,  
6 as an Agency, be able to divulge knowledge, this  
7 information publicly or otherwise in accordance with  
8 proprietary information law, so that your Agency has a  
9 feeling of confidence that it is in possession of the  
10 best and most up-to-date data that might be available  
11 on a particular product in order to assist the Agency  
12 or other agencies in the federal government in terms of  
13 its regulation?

14 DR. RITTER: You have asked several  
15 questions. I will try to deal with them fairly  
16 quickly.

17 The last question: Do we feel that we  
18 are impeded, the answer is no. And perhaps your other  
19 questions relate to why we have come to that  
20 conclusion.

21 The only agency in the world which is  
22 comparable to our own in terms of the kinds of studies  
23 that are required and the kind of review which is  
24 carried out on those studies, in my view, would be the  
25 United States Environmental Protection Agency, and the

1 United States National Toxicology Program which,  
2 although not a regulatory agency, is currently  
3 responsible for the cancer testing program in the  
4 United States.

5 The reason I say we don't feel impeded in  
6 that context is because actually I negotiated an  
7 agreement with the U.S. Secretary of State's Office  
8 about eight years ago which allows for the free  
9 exchange of information between Canada and the United  
10 States on matters relating to pesticide regulation.

11 THE CHAIRMAN: So there's a specific  
12 agreement covering this?

13 DR. RITTER: That's correct.

14 THE CHAIRMAN: Is that agreement public?

15 DR. RITTER: I believe we can make that  
16 agreement available. Again, I would seek advice,  
17 but...

18 THE CHAIRMAN: All right. I think that  
19 would be something that the Board would like to see if,  
20 in your opinion and that of your counsel, it's possible  
21 to make that public.

22 DR. RITTER: I will seek advice from  
23 counsel on that. I can assure you absolutely at this  
24 time that the agreement exists and that it was created  
25 specifically, having been the primary proponent of that

1       agreement, the intent was solely to allow the exchange  
2       of information which, due to proprietary  
3       considerations, might otherwise not have been  
4       exchanged.

5                   THE CHAIRMAN:   And do you know if there  
6       is agreements between the United States and other  
7       countries of a similar nature?

8                   DR. RITTER: I do not, but let me --  
9       there's a larger answer to that.   Both Canada and the  
10      United States are members of a number of international  
11      organizations at which many of these studies are  
12      discussed at regular intervals.

13                   These organizations would include the  
14      Food and Agricultural Organization of the United  
15      Nations, the Program on Chemical Safety of the World  
16      Health Organization, the Organization for Economic  
17      Cooperation and Development in Paris, and a number of  
18      others.

19                   All of these organizations exist, to some  
20      measure, for the purpose of providing an international  
21      forum for the discussion and deliberations of the very  
22      kinds of studies which are the subject matter of this  
23      particular panel.

24                   So that information which one  
25      jurisdiction may have on a given study which may not be

1 available in another, often becomes apparent during the  
2 course of these meetings.

3 THE CHAIRMAN: This would include  
4 proprietary information?

5 DR. RITTER: Yes, it does.

6 THE CHAIRMAN: The actual studies and  
7 names of the studies, where they were conducted, and  
8 how they were conducted, and all this?

9 DR. RITTER: Yes, it does. With specific  
10 reference to Canada and United States, Canada and the  
11 United States and Great Britain are members of a  
12 Tripartite Organization on Pesticide Regulation and  
13 that group meets approximately every 30 months or so  
14 and, again, for the purpose of discussing issues  
15 relating specifically to pesticide products as well as  
16 issues relating to philosophy on pesticide regulation.

17 The Tripartite group really exists in an  
18 attempt to harmonize pesticide regulation in three  
19 countries in which the regulations are seen to be  
20 somewhat comparable.

21 So, in summary, the answer to your  
22 question is: We do not feel impeded and the reason for  
23 that is because I think we have made some effort, both  
24 nationally and internationally, to assure that there is  
25 as free a flow of information as there can be within

1 the constraints that everyone's aware of.

2 THE CHAIRMAN: Okay, thank you.

3 DR. RITTER: You asked yesterday, Mr.

4 Castrilli, whether or not I would be able to make  
5 references available which related to the lecture that  
6 I delivered on the role of dietary fiber, fat and  
7 lifestyle in the etiology of cancer.

8 I will endeavor to provide you today with  
9 some rather contemporary review articles on that  
10 subject.

11 I was unclear, Mr. Chairman, if this item  
12 was being requested primarily as an interest item to  
13 Mr. Castrilli or if he would like it formally submitted  
14 to the Board.

15 THE CHAIRMAN: Were you intending to  
16 introduce it in evidence?

17 MR. CASTRILLI: Well, understandably I  
18 don't know what it is. Why don't we reserve on that  
19 until I see what the document is.

20 THE CHAIRMAN: Very well.

21 MS. CRONK: I would ask though, sir, that  
22 copies be made available to all other counsel.

23 MR. CASTRILLI: Yes. I have no objection  
24 to that.

25 THE CHAIRMAN: Very well.



1 of the data which you would be requesting and its  
2 releasability to you.

3 I mention that only because, in  
4 discussion with counsel, it would seem that it may  
5 eliminate the need, Mr. Chairman, for you to rule on an  
6 item which has already been ruled on.

7 THE CHAIRMAN: We also get into a  
8 question of competing jurisdiction as well, to whether  
9 or not the Board has the jurisdiction to require it  
10 notwithstanding it has been ruled out of the public  
11 domain by the Access to Information Commissioner is  
12 again another legal question in itself.

13 However, we won't go into that at this  
14 point.

15 MR. CASTRILLI: Mr. Chairman, if I  
16 understand the answer, it was: Cannot make studies  
17 available. Is that what you're saying?

18 DR. RITTER: Let me clarify that. I  
19 cannot make any information in addition to what I have  
20 already told you available at this time without further  
21 legal argument as to the department's ability to do  
22 that.

23 MR. CASTRILLI: Just so that we are  
24 clear, Mr. Chairman, I wasn't at any point asking for  
25 the provision of the studies themselves.

1 DR. RITTER: And, finally, just prior to  
2 the break we had some discussion as to the release of  
3 proprietary information and whether or not I could make  
4 a list of studies specifically available to the Board  
5 with regards to the additional studies which we may  
6 have on 2,4-D or, indeed, with regards to any other  
7 product that we may be discussing here.

8 I'm advised by counsel in two regards.  
9 The first is that we cannot at this time make those  
10 studies available and that should there be a desire to  
11 have those studies presented, the request would  
12 necessarily need to be directed to the statutory  
13 authority, that is the Minister of Agriculture, and  
14 advice given of that intent to the data owners so that  
15 they too would be provided with the opportunity to make  
16 representations as to the protection of their property.

17 I'm also advised by counsel that should  
18 you wish, Mr. Castrilli, to pursue that avenue, there  
19 is in place a formal mechanism by which you can do that  
20 without the need to necessarily involve the Board in  
21 legal argument and; that is, the Access to Information  
22 provisions. That is, there is a formal mechanism in  
23 place by which you may request access to these studies  
24 and this mechanism, if you like, is established solely  
25 for the purpose of determining the proprietary nature

1 THE CHAIRMAN: No, but I think he has  
2 gone further than that to say any information  
3 concerning the studies.

4 MR. CASTRILLI: Q. Dr. Ritter, just  
5 before the break we were looking at Exhibit 709, page  
6 E, and you had summarized very briefly what Canada has  
7 is the same or essentially the same as the U.S., and  
8 Canada has that may be, in your opinion, more than what  
9 the U.S. has.

10 I'm wondering if I could ask you just  
11 with respect to -- I'm sorry page E.

12 DR. RITTER: A. Yes.

13 Q. Pharmacokinetic and mutagenicity,  
14 just focussing on those two, essentially the metabolism  
15 and the mutagenicity studies when they indicate that  
16 Canada has more information than the U.S. that it  
17 relies upon for the continued registration of 2,4-D; is  
18 that right?

19 A. No, I didn't say that. I said we  
20 have more information than cited in the U.S. position  
21 document in September of 1988. I cannot attest to the  
22 information which EPA has, I have no idea what EPA has.

23 We do have information which is not  
24 referenced in the position document in September of  
25 1988, but I would point out, in the interest of

1 clarity, as was mentioned this morning, that document  
2 is current to February of 1987 notwithstanding the  
3 publication date, so that it's entirely position that  
4 EPA has the very information to which I'm referring.  
5 And in the case, at least of metabolism studies, I  
6 indicated to you, there is absolutely no question that  
7 they have the study.

8 So my reference as to information that we  
9 have relates to studies cited in the September, 1988  
10 position document and should not be taken in any way to  
11 imply that I have any knowledge of what EPA has.

12 Q. Dr. Ritter, I understand there have  
13 been a number -- there have been and are ongoing a  
14 number of epidemiological studies on 2,4-D both in  
15 Canada, the U.S. and elsewhere; is that right?

16 A. Yes.

17 Q. And the epidemiology, generally  
18 speaking, is the science that deals with the incidence,  
19 distribution and control of disease in a population?

20 A. Yes.

21 Q. And can you confirm for me that these  
22 studies have been conducted to -- or, generally  
23 speaking, these studies have been conducted to  
24 investigate the association of human exposure to  
25 phenoxy herbicides which includes 2,4-D and the



1 incidence of such diseases as soft-tissue sarcoma,  
2 that's also known as STS -- and, I'm sorry you have to  
3 say yes not just nod yes.

4 A. Yes.

5 Q. Secondly, non-Hodgkin's lymphoma, the  
6 acronym NHL?

7 A. Yes.

8 Q. Not to be confused with the National  
9 Hockey League and; thirdly, Hodgkin's Disease, the  
10 acronym HD?

11 A. Yes.

12 Q. Have there been other associations  
13 with other diseases or do those three constitute the  
14 main ones in relation to the phenoxy herbicides  
15 generally and 2,4-D in particular?

16 A. The diseases that you refer to are  
17 various forms of cancer and if you are asking as to the  
18 association or the studies that have been conducted on  
19 exposure to phenoxy herbicides and cancer, I would say  
20 that that captures the essence of the types of  
21 investigations that have been done.

22 Q. Thank you. I would like to briefly  
23 review with you what would necessarily be, I suspect,  
24 an incomplete chronology but a chronology nonetheless  
25 of the findings of some of these studies to date.



1                   The first one I would like to discuss  
2           with you is actually found in a 1976 scientific article  
3           based on a two-year study of herbicide users conducted  
4           by the U.S. National Cancer Institute and several  
5           Kansas universities?

6                   A.   Are you referring to a 1986 study,  
7           Mr. Castrilli?

8                   Q.   Yes.

9                   A.   You said '76.

10                  Q.   Did I say '76.   Excuse me, I meant  
11           1986?

12                  A.   Yes.

13                  Q.   Entitled: Agricultural Herbicide Use  
14           and Risk of Lymphoma and Soft Tissue Sarcoma, it  
15           appeared in the Journal of the American Medical  
16           Association in September, 1986.   Are you familiar with  
17           that?

18                  A.   Yes, very.

19                  MR. CASTRILLI:   Mr. Chairman, I  
20           understand that in this article there is one table  
21           which subsequently had a table title correction.   I do  
22           not have the table title correction at this time, nor  
23           do I in fact know which table title was corrected, but  
24           I will undertake to find that correction which I  
25           understand appeared in the same volume but a different

1 issue, and I will make that available to complete what  
2 would be the next exhibit.

3 DR. RITTER: I'm sorry, I can save you  
4 the trouble, I do have it.

5 MR. CASTRILLI: The table title  
6 correction?

7 DR. RITTER: Yes.

8 THE CHAIRMAN: Well, do you want to hand  
9 it out and all of us can make the correction right on  
10 the document?

11 MR. CASTRILLI: That will be fine. And I  
12 think it's just the title itself, so it would only  
13 involve correcting the title.

14 THE CHAIRMAN: All right. Exhibit 754.

15 ---EXHIBIT NO. 754: Article entitled: Agricultural  
16 Herbicide Use and Risk of Lymphoma  
17 and Soft Tissue Sarcoma, Journal  
18 of the American Medical  
19 Association in September, 1986,  
conducted by the U.S. National  
Cancer Institute and several  
Kansas universities.

20 MR. CASTRILLI: (handed)

21 THE CHAIRMAN: Thank you.

22 MR. CASTRILLI: Sorry, Dr. Ritter, you  
23 have a copy of this no doubt?

24 DR. RITTER: Yes, I do. I'm just trying  
25 to find the correction.

1                   THE CHAIRMAN: Dr. Ritter, if we might,  
2                   just a follow-up question to my earlier question put to  
3                   you right after the break.

4                   Do you feel, in your opinion, that the  
5                   American manufacturers of pesticides view Canada,  
6                   because of the smaller market I suppose, as a junior  
7                   partner in the regulatory process to the extent that  
8                   there is any kind of priority disclosure in favour of  
9                   the U.S. regulatory agencies as opposed to the  
10                  Canadian?

11                  That is not to say that they don't have  
12                  to provide the information to the Canadian authorities  
13                  to get registered, but there is a major time gap as to  
14                  when that information is made available?

15                  DR. RITTER: I would say that it's not  
16                  uncommon for registration petitions to be submitted  
17                  first to the United States and that there may be a lag  
18                  of, in some cases, several years before the same  
19                  petition is made available in Canada.

20                  Generally speaking, because of business  
21                  interests, petitions will be submitted in those  
22                  jurisdictions where the potential market is the  
23                  greatest.

24                  THE CHAIRMAN: Having said that, would  
25                  you still have that information available through your

1       agreements with these other jurisdictions,  
2       notwithstanding that there is not a formal application  
3       before you for registration?

4                     DR. RITTER:  Oh yes.

5                     THE CHAIRMAN:  In other words, you are  
6       kept up to date with what is going on, notwithstanding  
7       you don't have an application before you?

8                     DR. RITTER:  We can be, but if the  
9       product is not used in Canada or if the product in fact  
10      is not even intended for use in Canada, as is evidenced  
11      by the absence of a registration petition, we may only  
12      have a passing interest in the toxicology issues  
13      because the product is not in use here.

14                    Except when the product is used elsewhere  
15      but will result in residues in food imported into  
16      Canada, in which case we require exactly the data  
17      package which I have already detailed for you as if  
18      that product were going to be used in Canada.

19                    THE CHAIRMAN:  I.e., through importation?

20                    DR. RITTER:  That's correct.

21                    THE CHAIRMAN:  Okay, thank you.

22                    Now, perhaps you could tell us what the  
23      correction is in Exhibit 754?

24                    DR. RITTER:  I would very much like to do  
25      that, Mr. Chairman.  I suppose it as, may become

1       evident to the audience already, I'm perhaps not the  
2       world's most organized person.

3               MR. MARTEL: I thought you might be  
4       teaching at a university.

5               DR. RITTER: I have it somewhere. Let me  
6       just say that for the purposes of this discussion I  
7       don't think it will materially affect the questions or  
8       the answers.

9               I can tell you that what it really  
10      relates to is the identification of Table 3,  
11      non-Hodgkin's lymphoma in relation to duration,  
12      frequency and latency of 2,4-dichlorophenoxyacetic acid  
13      use.

14              MR. CASTRILLI: Q. Dr. Ritter, perhaps  
15      over the break if you don't actually know what the  
16      correction to the title is you can advise us in the  
17      afternoon.

18              Mr. Chairman, just before we continue  
19      with Exhibit 754, there is one document that I had  
20      previously provided to Dr. Ritter which I just wanted  
21      to enter onto the record.

22              I had actually provided it to him in  
23      partial form and I have now provided to his counsel,  
24      Ms. Murphy, a complete version of the document and  
25      before I continue with the epidemiological studies, I



1 would like to file it at this time because it relates  
2 to the previous discussion we have been having.

3 It's entitled: Pesticide Fact Sheet  
4 issued September, 1988 by the U.S. Environmental  
5 Protection Agency. It's a 12-page document. I might  
6 ask that it be made the next exhibit.

7 THE CHAIRMAN: What is the date again?

8 MR. CASTRILLI: September, 1988. It's in  
9 fact the summary of the contents of Exhibit 748.

10 Sorry that would be Exhibit...?

11 THE CHAIRMAN: 755.

12 ---EXHIBIT NO. 755: 12-page document entitled:  
13 Pesticide Fact Sheet issued  
September, 1988 by the U.S. EPA.

14 MR. CASTRILLI: (handed)

15 THE CHAIRMAN: Thank you.

16 DR. RITTER: Mr. Castrilli, as you are  
17 aware, we were only provided initially with three pages  
18 of this document.

19 MR. CASTRILLI: Yes. I'm going to  
20 provide you with the entirety of it, I'm only going to  
21 ask you questions about the pages you already have from  
22 me.

23 THE CHAIRMAN: Well, subject again to  
24 whether or not the witness feels the other nine pages  
25 are relevant to his answers on those three pages.

1 MR. CASTRILLI: Yes, that's fine. That's  
2 fine. If you wish to comment in the afternoon on that,  
3 I have no objection.

4 MR. CASTRILLI: Dr. Ritter, I submit to  
5 you now the entirety of what is now Exhibit 755.  
6 (handed)

7 MS. BLASTORAH: Mr. Chairman, I have now  
8 been handed by Dr. Ritter the correction to that table  
9 title, so perhaps I can just perhaps read that out  
10 while we are marking things.

11 THE CHAIRMAN: Very well.

12 MS. BLASTORAH: Okay. The correct  
13 title -- I am sorry, I have a very poor reproduction  
14 here, but Table 3 should have read as follows: Table  
15 3, non-Hodgkin's Lymphoma in Relation to Duration,  
16 Frequency and Latency of Herbicide Use.

17 Let me know if I'm going too fast, I  
18 don't have the actual table in front of me.

19 THE CHAIRMAN: All right. This is where  
20 it's different. Of Herbicide Use...?

21 MS. BLASTORAH: Right. Duration,  
22 Frequency and Latency of Herbicide Use among  
23 2,4-dichloro -- I'm sorry, the rest of that word is  
24 obliterated or semi -- I believe it's already on the  
25 table.

1 MR. KINGSBURY: That's the acidic acid.

2 MRS. KOVEN: It is  
3 2,4-dichlorophenoxyacetic acid.

4 MS. BLASTORAH: Acid Users is the rest of  
5 the correction.

6 THE CHAIRMAN: Okay. We seem to have  
7 lost the witness.

8 MR. CASTRILLI: We lost Dr. Ritter.

9 THE CHAIRMAN: It happens to all of us at  
10 some point, Dr. Ritter.

11 DR. RITTER: I'm sorry, Mr. Chairman.  
12 One of the first things I learned in pharmacology was  
13 that caffeine was a potent diuretic and as an  
14 undergraduate we were required to attend a seminar  
15 lecture series in the department. In fact, the only  
16 way they could assure reasonable attendance at these  
17 seminars was to force graduate students to attend them.

18 We were warned beforehand never to have a  
19 beer for lunch prior to a seminar and I'm afraid I just  
20 haven't learned the lesson, but my apologies.

21 MR. CASTRILLI: Q. Dr. Ritter, do you  
22 now have a complete copy of Exhibit 755?

23 A. Yes, I do.

24 Q. I'm referring you to page 11. Sorry.  
25 To your knowledge, this constitutes a summary of the

1 September, 1988 U.S. EPA reregistration document; is  
2 that right?

3 A. I don't know how to answer that  
4 question. I don't know what this represents except  
5 what the title implies, Pesticide Fact Sheet.

6 Q. Would you accept, subject to  
7 verification, that this exhibit was released at the  
8 same time as the registration document?

9 A. Yes.

10 Q. All right, thank you. We are looking  
11 at page 11 and under the heading: Summary of Major  
12 Data Gaps, do you see that title?

13 A. Yes.

14 Q. The agency notes:

15 "The following data are required for  
16 2,4-D acid. The agency is also requiring  
17 data on each individual ester and amine  
18 of 2,4-D."

19 And, Dr. Ritter, if we could go to the  
20 column or the sub-column under the heading: Studies  
21 for Toxicology, just in relation to the ones you and I  
22 discussed this morning, you will see that we have a  
23 heading for chronic toxicity non-rodent -- sorry,  
24 teratogenicity rabbit, special dermal neurotoxicity,  
25 and then a heading called reserved oncogenicity two

1 species.

2 Is there any indication that those, among  
3 others, are regarded as containing major data gaps for  
4 the U.S. EPA at the time this was released?

5 A. That's what's noted in the document,  
6 yes.

7 Q. And it's your testimony that, in your  
8 opinion, such major data gaps do not exist in Canada?

9 A. No, I didn't say that. I said that  
10 some of these studies were indeed being required by  
11 Canada. We were referring specifically in our  
12 discussion to the cancer studies and the need to  
13 conduct those studies on each form of 2,4-D  
14 commercially available and, in that context, I stand by  
15 the answer I gave you earlier.

16 Q. Well, would you agree with me that it  
17 is -- that U.S. EPA regards it as a major data gap?

18 A. Yes.

19 Q. Does Canada regard it as a major data  
20 gap?

21 A. Could you help me with the "it"?

22 Q. Sorry, the gaps identified in  
23 relation to the studies, do you regard those as  
24 constituting major data gaps in Canada?

25 A. No, not the entire list.



1 Q. Which ones would constitute major  
2 data gaps in Canada under the toxicology heading?

3 A. At the present time we are in the  
4 process of awaiting additional information with regards  
5 to irritation, teratology, and may require additional  
6 information with regards to metabolism.

7 The adequacy of the chronic toxicity and  
8 oncogenicity studies, as I've indicated to you this  
9 morning, will only be determined in Canada in the  
10 definitive sense following our evaluation of the kidney  
11 pathology which is currently underway.

12 Q. Sorry, that was the chronic toxicity  
13 you said?

14 A. Chronic toxicity/oncogenicity.

15 Q. Okay.

16 A. You may wish to note, Mr. Castrilli,  
17 that I believe there is an error in the list in that  
18 they indicate chronic toxicity non-rodent which is  
19 inconsistent with the position document issued by the  
20 agency.

21 That was in part why I -- in answering  
22 your question as to whether or not I'm prepared to  
23 accept this as a result of their issuance of the  
24 reregistration document, there is some important  
25 differences between what this says and what the

1 reregistration document says.

2 Q. Is it your -- what is your  
3 understanding with respect to chronic toxicity? Should  
4 it in fact say rodent?

5 A. Yes.

6 Q. Okay.

7 A. That would be consistent with what  
8 the reregistration document says.

9 Q. Thank you.

10 THE CHAIRMAN: Just to clarify once  
11 again, notwithstanding your characterizing some of  
12 these studies in terms of a data gap, that does not  
13 imply, in your view, any problem with the continued  
14 registration of any of the products.

15 DR. RITTER: That's absolutely correct.  
16 There is -- I have indicated that, for example, we are  
17 requiring additional information with regards to  
18 teratology in the rabbit.

19 We do have information on teratology and  
20 the information available to us suggests that there is  
21 no evidence of an adverse -- of potential birth defects  
22 in association with the use of the product.

23 So that the information available to us  
24 does not imply that there is a hazard. We would,  
25 nevertheless, like the information available to us to

1 be more comprehensive than it is and, consequently, are  
2 requiring this additional study, but not because there  
3 is any evidence of an adverse effect.

4 THE CHAIRMAN: Okay. And that, in your  
5 understanding, is also the position of the U.S.  
6 Protection Agency in terms of the document -- the  
7 source document which is Exhibit 748?

8 DR. RITTER: Yes. In fact, it is their  
9 stated conclusion that they have -- they are not -- I  
10 am paraphrasing here a little bit, but that they are  
11 not concerned at the present time.

12 They've said a couple of things in there.  
13 They are not sending the product to special review  
14 which, in the United States, means that they do not  
15 consider that there are any concerns which require  
16 their immediate attention. They are prepared to allow  
17 these studies to unfold and be reviewed in the normal  
18 course of events.

19 The Americans have the option to send a  
20 product through a process that they call special review  
21 and initially had contemplated that process for 2,4-D,  
22 in part because of the Kansas studies to which Mr.  
23 Castrilli referred to a moment ago.

24 On evaluation and referral to the Science  
25 Advisory Panel, the agency changed its mind and elected

1 not to subject the product to special review, and the  
2 essence of that detail is contained in the two Federal  
3 Register notices with which I have provided the Board  
4 earlier this morning.

5 So we are essentially in agreement, the  
6 Canadians and Americans, as to the concern that the  
7 status of these studies or, if you like, the lack of  
8 concern that these studies have identified.

9 THE CHAIRMAN: So would it be fair to say  
10 that the term used in these documents, data gap, may be  
11 somewhat misleading to the public at large in implying  
12 that there is no information available in terms of  
13 these studies and, therefore, you have products on the  
14 market whereby appropriate studies to determine the  
15 appropriateness of having those products registered for  
16 use were in fact not made?

17 DR. RITTER: That's correct. The  
18 statements made in documents of this kind are, if you  
19 like, very technically oriented. If the study,  
20 strictly speaking, in the United States for example,  
21 does not satisfy a protocol established in U.S. law,  
22 then that would be considered a data gap.

23 That's not the same thing as saying that  
24 the available information cannot go to some length to  
25 assess that potential hazard. There is an important

1 difference between a study that can fully satisfy a  
2 predetermined protocol and a study that provides useful  
3 biological information.

4 A study may not fulfill a protocol, but  
5 at the same time provide very useful biological  
6 information and many of these studies that are  
7 identified here fall into that category exactly.

8 That's not my conclusion, it's the  
9 conclusion of the Americans, and I would refer you  
10 specifically to page 25 of what is now Exhibit 748.  
11 And among other things -- I think the phrase for that  
12 is inter alia; is that right?

13 Sentence No. 1 says:

14 "The agency will not place 2,4-D in  
15 special review at this time."

16 And then if you go on to read the  
17 rationale it talks about some of the toxicology and  
18 epidemiology and the need for additional studies, that  
19 concludes therefore in March, 1988:

20 "EPA proposed not to initiate a special  
21 review of the chemical at this time."

22 And that's why I'm concluding for you at  
23 this time that as far as the importance of the data  
24 gaps and our ability to arrive at a conclusion at this  
25 point, I don't think that the Americans and we are very



1 far apart in the way we view the context of these  
2 studies, and that's perhaps the essence of the issue  
3 over here.

4 THE CHAIRMAN: But there is some  
5 difference in the use of the term data gap vis-a-vis  
6 the Canadian situation?

7 DR. RITTER: That's based -- I'm sorry.

8 THE CHAIRMAN: You don't have in Canada  
9 the same kind of protocols which are required as a  
10 matter of pre-registration as of law to the extent that  
11 the Americans do?

12 DR. RITTER: That's correct. The  
13 Americans list not only the study that's required, but  
14 they list the way in which that study must conducted.  
15 And a study that is not conducted in compliance with  
16 those rules may be rejected, regardless of the  
17 biological information that it provides.

18 At the expense of sounding somewhat  
19 cynical, it's a checklist kind of an approach.

20 We do not have protocol requirements in  
21 Canada for any study. Our guidelines indicate that  
22 studies conducted in compliance with Canadian law  
23 should generally be in accordance with national and  
24 international study designs for the particular end  
25 point under investigation and we reference, among

1 others, U.S. protocols, but they are one of several  
2 that we reference in our data requirements.

3 So that we tend to place much more  
4 emphasis on the quality of the biological information  
5 emanating from the study rather than on the protocol  
6 which it necessarily followed in the strictest sense.

7 THE CHAIRMAN: Do you feel this is a  
8 better system?

9 DR. RITTER: We do.

10 THE CHAIRMAN: Why, because it allows you  
11 more flexibility?

12 DR. RITTER: Because it allows an  
13 interpretation of the study rather than the protocol.  
14 At the end of the day the purpose of the exercise is to  
15 determine whether or not a chemical produces an adverse  
16 effect, be it in the environment or in man. The  
17 protocol in itself does not necessarily make that  
18 determination.

19 If I can just very quickly digress by way  
20 of example. If one were to consult U.S. guidelines at  
21 this time you would find that they require that cancer  
22 studies be conducted in groups of not less than 50, and  
23 because these studies are conducted over the majority  
24 of an animal's lifespan, there are a number of deaths  
25 which occur during the course of the study.

1                   Now, in our case, we are more interested  
2                   in the number of survivors at the end of the study than  
3                   we are necessarily in the number of animals that begin  
4                   the study, because if there is a very small number of  
5                   survivors and because we generally don't expect cancer  
6                   to be expressed until some time late in the study, it  
7                   is possible that early death may lead to a conclusion  
8                   of the absence of tumors when, in fact, the animal  
9                   wasn't alive long enough for the tumor to have  
10                  expressed itself.

11                  It's simply an example of why we feel  
12                  that it's absolutely essential to evaluate the outcome  
13                  of a study in concert with the protocol, obviously, but  
14                  not exclusive of the protocol. And we have been  
15                  resistent over the years to introduce very rigid study  
16                  protocol requirements.

17                  THE CHAIRMAN: Thank you.

18                  MR. KINGSBURY: Mr. Chairman, if I might  
19                  just build on that because this issue has already  
20                  arisen with respect to environmental fate and  
21                  toxicology studies.

22                  I think there are other examples directly  
23                  from the documents that Mr. Castrilli has provided that  
24                  might further inform you on this.

25                  For example, on page 21 of the 2,4-D

1 reregistration document, document -- Exhibit 748, it is  
2 talking here about effects on fresh water  
3 invertebrates.

4 THE CHAIRMAN: We don't have that page.  
5 That's the one, Ms. Murphy, that was going to be  
6 reproduced in its entirety for the Board and the other  
7 parties. I think Ms. Cronk originally had a copy of  
8 the whole study here.

9 MR. CASTRILLI: Actually, Mr. Chairman --

10 MS. CRONK: Mr. Chairman, it's Mr.  
11 Castrilli's exhibit.

12 MR. CASTRILLI: Yes, it's my exhibit.

13 THE CHAIRMAN: I am sorry.

14 MR. CASTRILLI: And because I'm using it  
15 as I'm going along, I haven't been able to submit it  
16 for reproduction. I may well have to wait until later  
17 this afternoon before I can even do that.

18 THE CHAIRMAN: Okay. Well, to make your  
19 point, Mr. Kingsbury, are you going to be quoting a  
20 long portion of that?

21 MR. KINGSBURY: I will read exactly what  
22 it says. Basically they present data for a number of  
23 species and they say:

24 "In addition, a study using 2,4-D  
25 formulated product on peliamontis

1 cateocancis..."

2 Which is a grass shrimp,

3 reported this:

4 "This study does not satisfy requirements  
5 for registration because the test species  
6 is not a recommended species."

7 Okay. In the protocols that EPA requires  
8 they say it has to be done on this, that and the other  
9 species. Okay. It gives a list of recommended  
10 species, and mature individuals were used. In their  
11 protocol they require it being done on juveniles.

12 "The study however is a valid study."

13 So they are saying it's a valid study, it  
14 gives presumably useful information regarding an  
15 environmental effect, in fact, essential information if  
16 you want to know what the effect on that organism would  
17 be. It is, however, not accepted as satisfying this  
18 checklist of requirements because it's not on a species  
19 listed in those requirements.

20 THE CHAIRMAN: And if I understand Dr.  
21 Ritter's evidence, if that were the only study in that  
22 category, it would be expressed as a data gap?

23 MR. KINGSBURY: That's correct.

24 DR. RITTER: That's correct.

25 THE CHAIRMAN: In the U.S., but perhaps



1 not so in Canada?

2 DR. RITTER: That's correct.

3 MR. KINGSBURY: Yes. If I might just  
4 give one more example with respect to environmental  
5 fate, and this comes from the picloram reregistration  
6 document. I don't have the exhibit number on this.

7 MS. BLASTORAH: No. 742, Mr. Chairman.

8 MR. KINGSBURY: 742. And this is on page  
9 19. It's the last sentence of the second last  
10 paragraph. This is a residue dissipation study and  
11 basically it says:

12 "This study does not fulfill guideline  
13 requirements because no freezer storage  
14 stability data were provided."

15 In other words, what they're saying is if  
16 the study doesn't have a record of the -- basically the  
17 operating -- operation of the freezer in which the  
18 samples were stored between the time they were  
19 collected and analysed, by the guideline's requirements  
20 this study is not acceptable; there would be a data  
21 gap.

22 That in no way suggests that this study  
23 may not be totally valid. In fact, as you can imagine,  
24 many of the studies that would be in older databases,  
25 being unaware of these requirements, would not contain

1       that information. Suffice it to say that one would  
2       assume that if you said samples were stored in a  
3       freezer until analysis, one might have assumed that  
4       that basically satisfied the requirement saying proper  
5       storage occurred.

6                       Now there is a requirement to document in  
7       fact that, the storage conditions under which they were  
8       stored.

9                       THE CHAIRMAN: Thank you.

10                      MR. CASTRILLI: Thank you.

11                      Q. Dr. Ritter, we were about to discuss  
12       Exhibit 754. It's the -- for ease of reference I will  
13       call it the NCI Kansas study?

14                      DR. RITTER: A. Yes.

15                      Q. Among other things, this study  
16       reported a sixfold excess risk of non-Hodgkin's  
17       lymphoma - it's NHL - among farmers exposed to  
18       agricultural herbicides 20 or more days per year; is  
19       that right?

20                      A. That's correct.

21                      Q. Now, Dr. Ritter, would it be fair to  
22       say that this particular scientific article created  
23       quite a stir in regulatory and public health circles in  
24       Canada and U.S. at the time it was published?

25                      A. I can certainly speak about Canada,

1 less well about the United States. I would say that in  
2 Canada -- I should perhaps preface my remarks by saying  
3 that Aaron Blair, who is both a close friend and a  
4 close colleague and collaborator and has been for some  
5 years, in fact, Aaron Blair was one of our principal  
6 advisors in the design of the Canadian Farm Operator  
7 Mortality Study. So that Dr. Blair's work is not new  
8 to us and we were apprised of this study before it was  
9 published.

10 Dr. Blair very kindly agreed to come and  
11 address my group with the results of this study so that  
12 we could have firsthand information on the kinds of  
13 things that don't necessarily always work their way  
14 into a publication - how shall I put it - the personal  
15 experiences and difficulties that one may have  
16 encountered in the study, those kinds of things.

17 So that we were tremendously interested  
18 in the results because of the potential impact that  
19 these results may have in Canada; that is, we were  
20 quite concerned about the implications of these results  
21 for Canadian agricultural workers.

22 Q. Would it be fair to say that this  
23 study would have been one of the developments in the  
24 mid-1980s or thereabouts that, as you put it last week,  
25 may have led some to conclude 2,4-D was an animal

1 carcinogen at the time?

2 A. No. This study does not relate to  
3 animal data whatsoever and anyone who would have  
4 concluded from this study that it's an animal  
5 carcinogen either would not have read the study, or if  
6 they read it, would not have understood it.

7 This is a human epidemiology  
8 investigation and provides no information whatsoever on  
9 animal investigation.

10 Q. Are you familiar with the 1976  
11 Agriculture Canada memorandum to Canadian Agricultural  
12 and Pest Control Officials?

13 A. 1986 I think you are referring to?

14 Q. Yes.

15 A. And I am.

16 Q. It was a memorandum written by Dr.  
17 Frank Cedar?

18 A. Yes.

19 Q. September 11, 1986?

20 A. Yes.

21 Q. And it was in fact prompted, at least  
22 in part, by the publication of what is now Exhibit 754?

23 A. Mr. Castrilli, it was prompted  
24 entirely by the Department of Health and Welfare. It  
25 was at our request that that advisory was issued.

1 THE CHAIRMAN: Are you going to put that  
2 in, Mr. Castrilli?

3 MR. CASTRILLI: Yes.

4 THE CHAIRMAN: It will be Exhibit 756.

5 DR. RITTER: But now that you have  
6 introduced that item, Mr. Castrilli --

7 MR. CASTRILLI: Well, just hold on.  
8 Let's do one thing at a time or we will lose the fight  
9 over control of the paper in this hearing.

10 Mr. Chairman, I have attached a one-page  
11 addition. It's not the entirety of an article, but  
12 it's an article, I understand, that came out the week  
13 before Exhibit 756 was released which simply is a  
14 summary -- a partial summary of the NCI cancer study.

15 The reason why I have done it, it will  
16 become obvious as we get through it in detail, but the  
17 date of that article is September 4, 1986 in the  
18 Pesticide and Toxic Chemical News.

19 THE CHAIRMAN: Okay. Do you have the  
20 entirety of that article available for the witness and  
21 counsel?

22 MR. CASTRILLI: I don't actually, and I  
23 frankly will be content to either provide that with a  
24 separate number or reserve it with a separate number  
25 and make it available.



1 THE CHAIRMAN: All right. Why don't we  
2 do that --

3 MR. CASTRILLI: I'm content to do that.

4 THE CHAIRMAN: --on that basis? Why  
5 don't you put in the Agriculture Canada memorandum of  
6 1986 as Exhibit 756 and we will reserve the number 757  
7 for this other article.

8 DR. RITTER: Sorry, Mr. Castrilli, what  
9 is the other article to which you are referring?

10 MR. CASTRILLI: Sorry, it's Pesticide and  
11 Toxic Chemical News, September 4, 1986.

12 DR. RITTER: Oh yes.

13 MR. CASTRILLI: Mr. Chairman, the reason  
14 why I was intending to include this is, my  
15 understanding is that when Exhibit 756 was sent around  
16 the country The Pesticide and Toxic Chemical News  
17 article was attached to it.

18 I, however, don't have the entirety of  
19 that article and I originally intended to simply  
20 provide it as a package, but since I don't have it all  
21 I thought I would simply advise you and let you decide  
22 how you wanted to treat that second one.

23 THE CHAIRMAN: Well, we have noted on the  
24 record that it was your belief that it was sent around  
25 together with Exhibit 756.

1 MR. CASTRILLI: Yes.

2 THE CHAIRMAN: But why not, for the  
3 purposes of the record, give it a separate number so  
4 that when you actually produce the entire article we  
5 can treat it on that basis.

6 MR. CASTRILLI: That will be fine. Thank  
7 you. If you will bear with me for one moment I am  
8 going to remove the last page, therefore, from each of  
9 these.

10 MS. CRONK: Sorry, sir. I don't mean to  
11 be obtuse. Why are we removing the last page? Is it  
12 because it is the extract from that. I don't have it  
13 so...

14 THE CHAIRMAN: We will get the whole  
15 thing, Ms. Cronk, in the form of Exhibit 757.

16 MS. CRONK: Thank you.

17 MR. CASTRILLI: I was trying to cut down  
18 on the number of exhibit numbers, but under the  
19 circumstances it's probably not the best way to  
20 proceed.

21 THE CHAIRMAN: It is not often we have  
22 the sight of counsel ripping up his own exhibit.

23 MS. SEABORN: I would be prepared to  
24 remove my own last page, Mr. Castrilli, if that would  
25 assist.

1 MR. CASTRILLI: That's fine.

2 (handed)

3 THE CHAIRMAN: Thank you.

4 ---EXHIBIT NO. 756: Memorandum from Agriculture Canada  
5 to Canadian Association of Pest  
6 Control Officials Public Interest  
and User Groups dated September  
19, 1986.

7  
8 ---EXHIBIT NO. 757: Article entitled: Pesticide and  
(reserved) Toxic Chemical News, dated  
September 4, 1986.

9  
10 MR. CASTRILLI: Q. Now, Dr. Ritter, do  
11 you recall a discussion you had with the Chairman on  
12 what I believe was August the 11th, last week,  
13 regarding 2,4-D and carcinogenicity?

14 MS. MURPHY: I understand you are going  
15 to be referring the witness to some piece of transcript  
16 he has not seen and I'm sure he doesn't remember what  
17 he said on August 11th.

18 MR. CASTRILLI: Well, why don't you  
19 provide him a copy then?

20 THE CHAIRMAN: Should I know what I said?

21 MR. CASTRILLI: Do we normally make  
22 excerpts from the transscript further exhibits?

23 THE CHAIRMAN: No. It doesn't have to be  
24 an exhibit, I just wondered if I might have a copy of  
25 the transcript in front of me.

1 MR. CASTRILLI: I was only given one copy  
2 myself. It doesn't have a volume number yet because it  
3 hasn't been printed.

4 It's last Friday's and in fact the  
5 numbers that appear on these pages, I understand, may  
6 not eventually be the numbers used.

7 Mr. Chairman, Ms. Cronk has kindly  
8 provided me with a copy.

9 THE CHAIRMAN: I may just have to deny  
10 that I said any of this, so I just want to see what I  
11 am purported or reputed to have said.

12 MR. CASTRILLI: Q. Now, Dr. Ritter, you  
13 were asked by the Chairman - this was in relation to  
14 Exhibit 716, as I recall - certain of the herbicides  
15 listed in one of the risk assessments had asterisks and  
16 certain of them did not, and the quote on that  
17 particular page from that table indicated that those  
18 herbicides indicated by an asterisk have not been shown  
19 to be carcinogens, and the Chairman noted that 2,4-D  
20 does not have an asterisk.

21 DR. RITTER: A. That's correct.

22 Q. Now --

23 MS. MURPHY: I think this was a  
24 discussion in relation to the Crump document; is that  
25 correct.

1 MR. CASTRILLI: Yes, Exhibit 716 is the  
2 Crump document.

3 Q. Now, in a further answer to a  
4 question, which I guess you have a copy of in front of  
5 you, in the second paragraph on what is identified as  
6 page 20 you say:

7 "At that time..."

8 And I guess the time we are referring to  
9 is really the mid-1980s, thereabouts?

10 DR. RITTER: A. Yes.

11 Q. "The information that was available  
12 on 2,4-D may have led some to conclude,  
13 at least in the absence of some  
14 clarification that came later on, that it  
15 was reasonable to assume that it was at  
16 least an animal carcinogen."

17 Then you go on to note that:

18 "Subsequent to that there have been  
19 additional analyses and  
20 investigations..."

21 And you note that:

22 "...most sources..."

23 I believe you are indicating today?

24 A. Yes.

25 Q. "...felt that the evidence was no



1 longer sufficiently convincing to arrive  
2 at that conclusion."

3 A. That's correct.

4 Q. Now, in 1986, September, would some  
5 of the folks who thought that 2,4-D might pose a  
6 carcinogenic risk have included the Department of  
7 National Health and Welfare?

8 A. Absolutely.

9 Q. Indeed, Dr. Ritter, if we now look at  
10 Exhibit 756--

11 A. Yes.

12 Q. --the memorandum that was prepared by  
13 Dr. Frank Cedar for the Department of Agriculture, I  
14 understand at your behest?

15 A. Yes.

16 Q. Can I ask you turn to page 2?

17 A. I should add, if I can, just in  
18 responding to your question at my behest.

19 The first full paragraph on page 2  
20 beginning with:

21 "Given these developments..."

22 That paragraph was not inserted at our  
23 advice or at our request and it is a statement with  
24 which I would have disagreed then and would disagree  
25 now.

1                   So if your questions relate to that, I  
2                   think you might be better served to cross-examine Dr.  
3                   Cedar on that as he was the author of the sentence  
4                   rather than I.

5                   Q.   Well, let's just go through the  
6                   sentence first, Dr. Ritter.   The sentence notes --

7                   MR. CASTRILLI:   I'm sorry, Mr. Chairman,  
8                   we are referring to page 2 of Exhibit 756, paragraph 2.

9                   THE CHAIRMAN:   Yes.

10                  MR. CASTRILLI:   Q.   And it's referring to  
11                  "Given these developments..."

12                  The developments that it is referring to  
13                  are the publication and release of the Kansas study; is  
14                  that right, Dr. Ritter, among--

15                  DR. RITTER:   A.   Among other things, yes.

16                  Q.   --other things.

17                  A.   Yes.

18                  Q.   And a new laboratory test?

19                  A.   That's correct.

20                  Q.   Is that right?

21                  A.   That's correct.

22                  Q.   So really two developments; is that  
23                  right?

24                  A.   A series of laboratory investigations  
25                  and the Kansas study, that's right.

1 Q. Thank you. Now, the sentence reads  
2 on page 2 -- or the paragraph reads on page 2:

3 "Given these developments, Health and  
4 Welfare Canada has taken the position,  
5 understandably, that the overall data  
6 suggests that 2,4-D is a human carcinogen  
7 and have informed their provincial health  
8 colleagues."

9 Now, you say all of the remainder of this  
10 article was written at your behest -- sorry, of this  
11 memorandum was written at your behest, save and except  
12 that paragraph?

13 A. That's correct.

14 Q. Dr. Cedar indicates that Health and  
15 Welfare Canada have informed their provincial health  
16 colleagues.

17 A. That's correct.

18 Q. In what form did that communication  
19 take?

20 A. In the form of a letter to the  
21 federal -- to members of the Federal/Provincial  
22 Advisory Committee on Occupational and Environmental  
23 Health.

24 Q. Would you be able to provide a copy  
25 of that letter to this Board?

1                   A. I don't know. It was in the form of  
2 Ministerial correspondence that's often held to be in  
3 PCO confidence. Again, I would have to seek advice on  
4 that. I don't know.

5                   I can tell you, in essence, what it said  
6 which may be more useful than actually arguing about  
7 whether or not I can make the letter available. It's  
8 up to you.

9                   Q. Tell me what it said.

10                  A. The letter said that: The Kansas  
11 study indicated that there may be a relationship  
12 between exposure to phenoxy herbicides and  
13 non-Hodgkin's lymphoma and at about the same time that  
14 that became known to us we were also in the midst of  
15 reviewing two cancer studies on 2,4-D in which there  
16 was increased incidence of astrocytomas or brain  
17 tumors in the rat study which was restricted to a  
18 single sex of a single dose in the one study.

19                  We then went on to advise provincial  
20 health authorities that until such time as we had an  
21 opportunity to conclude our review of the information,  
22 we were recommending that prudence be exercised in the  
23 use of this chemical.

24                  We did not indicate in that letter, nor  
25 did I indicate to Dr. Frank Cedar that 2,4-D was a

1 human carcinogenic as is suggested here in Dr. Cedar's  
2 note. I would have disagreed with that statement then  
3 and I would disagree with it now.

4 Q. Dr. Ritter --

5 A. I'm not quite done, Mr. Castrilli.  
6 As a public health agency, I feel that it is incumbent  
7 upon us to advise not only provincial health  
8 authorities but indeed Canadians in general of any  
9 issue that we feel may constitute a discernable health  
10 risk as soon as that becomes apparent to us.

11 If I'm guilty of anything in this  
12 particular scenario I am perhaps guilty of acting  
13 prematurely in the absence of a comprehensive review on  
14 the study, both the Kansas report and the rodent  
15 studies, for which I take full responsibility. And I  
16 might add, that I would probably do it again.

17 I would avoid waiting the one or two or  
18 three years that it might take until we could cross all  
19 the t's and dot all the i's before advising provincial  
20 health authorities to take care.

21 So I make no apology for the premature  
22 basis on which these recommendations were made, but I  
23 would add that our evaluation and that done in the  
24 United States has changed considerably since the time  
25 that this document was issued in 1986 and, in fact,



1 that message was communicated to the Chairman in the  
2 transcript to which you refer in which I said that in  
3 1986, based on those preliminary evaluations, one would  
4 have arrived at a very different conclusion than most  
5 investigators have concluded today.

6 Q. Dr. Ritter, the memorandum from Dr.  
7 Cedar was sent to all Canadian associations of pest  
8 control officials and others in September, 1986. I  
9 presume you would have received a copy at the time?

10 A. Yes.

11 Q. What action did you take to correct  
12 the paragraph referenced?

13 A. We informed Dr. Cedar that, to the  
14 best of our knowledge, that sentence would not be  
15 scientifically defensible.

16 Q. And did you ask Dr. Cedar to print a  
17 retraction?

18 A. I didn't ask Dr. Cedar to do anything  
19 except to inform him that the statement was not  
20 scientifically defensible and left to Dr. Cedar's  
21 discretion what action he felt was appropriate in view  
22 of that advice.

23 Our responsibility, Mr. Castrilli, is  
24 advisory not statutory and we felt some obligation to  
25 inform Dr. Cedar that the conclusion which he had

1 reached would not be supported by the available data.  
2 As to what he did with that suggestion was entirely up  
3 to him.

4 Q. Now, what communications did you have  
5 with Dr. Cedar prior to the time he prepared this  
6 memorandum?

7 A. We assisted in its preparation. As I  
8 indicated to you, this document was prepared at our  
9 request. We felt very strongly that Canadians should  
10 be informed at the earliest possible date of our  
11 ongoing evaluation of two rather critical pieces of  
12 information in the assessment of the safety of 2,4-D.

13 Q. You assisted in the preparation of  
14 this memorandum, save and except that paragraph?

15 A. No. Mr. Castrilli, I can't make this  
16 any clearer. We didn't write the document, the  
17 document was written at our request and based on  
18 information which we provided.

19 What I'm telling you is I would not have  
20 agreed then with that statement and I would not agree  
21 with it now. We did not write that statement. I don't  
22 think it's scientifically defensible, I did not think  
23 it was scientifically defensible then. We tried to  
24 make that message perfectly clear to the Department of  
25 Agriculture.

1 I don't know what more I can do to assist  
2 you in clarifying our position on that.

3 Q. What information did you provide to  
4 Dr. Cedar prior to his writing this memorandum?

5 A. We discussed the results of the very  
6 preliminary examination that we had had both of the  
7 Hoar work in Kansas and of the evaluation of the rat  
8 and mice cancer studies which had been in our hands at  
9 that point in time for only a very, very short period.

10 Q. Did you communicate to this -- this  
11 information to Dr. Cedar orally or in writing?

12 A. It was primarily through the course  
13 of meetings, in fact, it may have been exclusively  
14 through the course of meetings.

15 Q. Were there minutes of those meetings  
16 that you kept?

17 A. I don't think so.

18 Q. Were you shown a draft of this  
19 memorandum before it was sent?

20 A. I doubt it very much because if I had  
21 been I would have objected to it then.

22 Q. Now, just returning to the testimony  
23 you gave last Friday for a moment. And you have a copy  
24 of that in front of you; do you not?

25 A. I have the two pages, page 20 and 21.

1 Q. You say - I'm looking at the last  
2 paragraph again. You said:

3 "At that time the information that was  
4 available on 2,4-D may have led some to  
5 conclude, at least in the absence of some  
6 clarification that came later on, that it  
7 was reasonable to assume that it was at  
8 least an animal carcinogen."

9 You didn't at that time indicate that  
10 that assumption was also made by Health and Welfare  
11 Canada; is that right?

12 A. No, I didn't. I'm indicating that to  
13 you now, that at the time that that study first became  
14 available to us and, on the basis of the preliminary  
15 examination, we felt that it was in order for us to  
16 advise provincial health officials that until we could  
17 satisfactorily resolve this question to our  
18 satisfaction that prudence should be exercised in the  
19 use of this chemical.

20 We did that on the basis of a preliminary  
21 review, arguably one might suggest that we did it on  
22 the basis of premature information and that I was  
23 perhaps too hasty in suggesting that we issue that  
24 alert to provincial health.

25 MS. MURPHY: Let's just clarify again,

1 for a minute. The question that was put to Dr. Ritter  
2 that is being referred to in the transcript was a  
3 question with respect to what information was available  
4 at the time that the Crump report was prepared, it was  
5 not in relation to these other documents that we are  
6 discussing, all right.

7 And Dr. Ritter was explaining that at the  
8 time these people put together their report, which was  
9 published in May of 1986, at that time certain  
10 information would have been available to them.

11 Now, my friend is asking him questions  
12 about things that were available at another time, and  
13 let's just keep that clear.

14 MR. CASTRILLI: The period of time is May  
15 to September, 1986.

16 MS. MURPHY: And this Exhibit 754 of  
17 course published September, 1986.

18 MR. CASTRILLI: That's right. So we are  
19 talking about a four-month difference.

20 DR. RITTER: No, no. I think the point,  
21 Mr. Castrilli, is that the Crump report was in  
22 preparation for some years. That's a very, very  
23 lengthy detailed analysis, and that at the time that  
24 the Crump investigation was being carried out, the  
25 results of the cancer rodent bioassays would not have



1       been available in their entirety to Dr. Crump.

2                       So that his review could not have  
3       included an exhaustive analysis of studies which could  
4       not have been available to him at the time that he did  
5       the analysis.

6                       But we have now taken that a little  
7       further in talking about the rodent bioassays that were  
8       available to us and, in attempting to assist you to  
9       understand the background and incentive, the impetus  
10      behind issuing this document; that is what I have  
11      attempted to do.

12                      I'm telling you that at my request we  
13      advised provincial health officials and recommended to  
14      the Department of Agriculture that they advise their  
15      provincial counterparts through this vehicle, which has  
16      now been entered as Exhibit 756, because in my view the  
17      information, although not yet reviewed, was  
18      sufficiently important that we, at the very least,  
19      should advise our provincial counterparts both in  
20      health and agriculture that until we could  
21      satisfactorily resolve this situation, prudence was in  
22      order.

23                      I make no apology for having acted in  
24      that way and, given the opportunity, I suspect I would  
25      do it again.

1 MR. CASTRILLI: Q. Dr. Ritter, would you  
2 agree that these series of events are an indication of  
3 the scientific uncertainty with respect to 2,4-D that  
4 existed as late as September, 1986 in relation to  
5 whether or not 2,4-D caused cancer or not?

6 DR. RITTER: A. No, they weren't a  
7 reflection of the uncertainty, Mr. Castrilli, they were  
8 a reflection of the submission of a number of studies  
9 that suggested possible effects that had not been  
10 previously identified. That was the basis from my  
11 request to advise provincial health authorities.

12 Q. And this would have been a seminal  
13 memorandum for the Department of Agriculture to send to  
14 all pest control officials across the country; would it  
15 not?

16 A. No.

17 Q. No. Wasn't this the first one ever  
18 sent--

19 A. No.

20 Q. --with respect to 2,4-D?

21 A. Oh, with respect to 2,4-D. It's  
22 certainly not the first document issued by Agriculture  
23 Canada with regards to potential health effects of  
24 pesticides, absolutely not.

25 Q. Well, we are only talking about

1 2,4-D.

2 A. No, no, you asked me if it was  
3 seminal, if it was not the first one that was ever  
4 sent. The answer to your question is, no, it was not  
5 and there have been many that have been issued since  
6 that time. Of course, it was the first one on 2,4-D  
7 the studies had just come in. There wouldn't have been  
8 any information on which to issue a document prior to  
9 this one.

10 Q. Well, in relation to 2,4-D, it being  
11 the first one issued, would there not have been some  
12 attempt to ensure that the Government of Canada got it  
13 right before it issued such a memorandum?

14 THE CHAIRMAN: Well, Mr. Castrilli, with  
15 great respect, this witness has indicated what he said  
16 and the information passed on to Agriculture Canada.

17 Agriculture Canada formulated the memo,  
18 presumably from that information, and this witness has  
19 indicated he doesn't agree with their formulation of  
20 the second paragraph on page 2.

21 Whether or not Agriculture Canada would  
22 have taken pains to, in your words, get it right or  
23 not, is really a matter for Agriculture Canada. I  
24 don't see how you can elicit that information from this  
25 witness.

1 MR. CASTRILLI: Q. But it is clear, no  
2 retraction or clarification was issued by Agriculture  
3 Canada as a result of anything you may have said to Dr.  
4 Cedar subsequent to September 11, 1986; is that right?

5 DR. RITTER: A. No, that is not clear.  
6 I have no idea what Dr. Cedar issued subsequent to  
7 that. That's not clear at all.

8 Q. Did you ask him to send a retraction  
9 or a clarification to everybody he had sent the  
10 September 11th memo to?

11 A. Mr. Castrilli, I already answered  
12 that.

13 THE CHAIRMAN: He already explained --  
14 just a moment, just a moment, Dr. Ritter.

15 DR. RITTER: Sorry.

16 THE CHAIRMAN: Mr. Castrilli, the Board  
17 would appreciate in questioning this witness that you  
18 tone down your presentation, that is first of all.  
19 Secondly, the witness has clearly answered that. He  
20 indicated that his Branch was not under a statutory  
21 obligation to do anything other than advise and that  
22 they left it completely to Agriculture Canada to  
23 respond to being informed that Health and Welfare could  
24 not scientifically support paragraph 2.

25 It doesn't serve any purpose to repeat

1 the question and, effectively, force the witness to  
2 elicit the same answer.

3 MR. CASTRILLI: Mr. Chairman, with  
4 respect, I would like to have from Dr. Ritter the  
5 correspondence that Dr. Cedar says was sent to  
6 provincial health colleagues at the time.

7 THE CHAIRMAN: And Dr. Ritter indicated  
8 that he doesn't know whether that correspondence is  
9 covered by Ministerial PMO privilege or not, but it is  
10 something I believe, Dr. Ritter, you were going to look  
11 into?

12 DR. RITTER: Yes, I will.

13 MR. CASTRILLI: And I would also like to  
14 have an undertaking from Dr. Ritter to provide the  
15 Board and all copies with whatever communications  
16 transpired between himself and Dr. Cedar in relation to  
17 the preparation of Exhibit 756 or thereafter, if it's  
18 in writing.

19 MS. MURPHY: And he's already advised  
20 that there were meetings, he doesn't believe there are  
21 minutes. He's advised -- he's given the information  
22 already and I don't see any reason to go behind it.

23 THE CHAIRMAN: Well, I think in fairness,  
24 Dr. Ritter, you can just review this matter, if there  
25 is correspondence that you are in a position to put



1 forward, then perhaps you might undertake to do so.

2 DR. RITTER: Yes, sir.

3 MRS. KOVEN: Dr. Ritter, did you receive  
4 any reaction -- did you receive any reaction, your  
5 group, the Health and Welfare Canada, as a result of  
6 the issuance of this memo?

7 DR. RITTER: There was a period of some  
8 activity following the issuance, not so much directly  
9 to us from this but more from our advisory to  
10 provincial health authorities who in turn directed most  
11 of their questions that they received to us to address  
12 more directly.

13 I would say that there followed a period  
14 of considerable activity, probably for a year after  
15 this situation initially emerged. Now, during the  
16 course of that year that followed, much of what we had  
17 done in a rather preliminary, hasty context initially  
18 had had time to benefit from a more proper evaluation  
19 and it was during the course of the next 12 or 18  
20 months that it became evident to us and the Americans,  
21 for example, that what -- I'm going to digress just for  
22 a moment, if I may, because I think it's important.

23 The two studies in question, the rodent  
24 studies, were a cancer study conducted in mice and a  
25 cancer study conducted in rats. The mouse study was

1 considered to be negative both by ourselves and the  
2 Americans so it did not contribute in any way to the  
3 conclusion that there was cancer in association with  
4 2,4-D.

5 The rat study had a similar conclusion,  
6 there was no evidence of cancer in the rat study,  
7 except for the singular observation of this tumor in  
8 the top dose group of one sex of the one species  
9 restricted to that group.

10 There are two ways in which one examines  
11 the incidence of these tumors from a statistical point  
12 of view. One compares first the incidence of the tumor  
13 when compared to the concurrent control; that is, the  
14 control that has been run alongside with that  
15 experiment, as well as looking at the trend; that is,  
16 is there a dose response relationship, is there an  
17 increase in effect as a function of an increase in  
18 dose. A very important hallmark in biology.

19 This study even in its original form did  
20 not provide evidence of a statistically significant  
21 increase in any tumor including the brain tumor when  
22 compared to the concurrent control. The only evidence  
23 of a statistically significant increase was with  
24 regards to the trend analysis.

25 In the 12 to 18 months that followed,

1       there were a number of pathologists who were asked to  
2       review those brain slides and at the end of the day one  
3       of the conclusions that was reached was that one of the  
4       tumors in the high dose group had probably been  
5       misclassified toward the positive; that is, it had  
6       probably been diagnosed as a tumor and, in reality,  
7       probably was not. That analysis was done primarily by  
8       the CIIT Institute and Research, in Triangle Park.

9               What that did effectively was to take the  
10       result which was only marginal at best before and make  
11       it non-existent; that is, the relatively minor  
12       statistical relationship that had existed prior to that  
13       secondary evaluation was eliminated following the  
14       second evaluation.

15              So that at the time that we issued - and  
16       when I say we, I mean in the collective sense - this  
17       documentation both to provincial agriculture  
18       departments and Health it was based on information  
19       which had not been subjected to the intensity of review  
20       which I have just detailed for you.

21              But because of the very wide-spread use  
22       of 2,4-D and because of the concern that had been  
23       present for some years prior to these studies, I  
24       certainly felt an obligation to advise Canadians in  
25       general as to the level of activity that was underway

1 at that time.

2 MRS. KOVEN: So the concern that might  
3 have been aroused in the forestry sector as a result of  
4 receiving this from Agriculture Canada, how was that  
5 concern satisfied or at what point would they have  
6 received the information that, in fact, that was  
7 probably not the case?

8 DR. RITTER: There has not - I shouldn't  
9 say that - there have been a variety of communications  
10 that have been issued by the Department of Agriculture  
11 since issuing this.

12 There has been positions on 2,4-D that  
13 have been tabled at the semi-annual meetings of the  
14 Canadian Association of Pesticide Control Officials,  
15 the group to which this document was circulated  
16 updating the status of that review as it unfolded.

17 So that I think the current thinking of  
18 the status of these various studies, including  
19 epidemiology, would be more or less apparent to anyone  
20 who had a legitimate interest in it, because these  
21 newer conclusions have been communicated through these  
22 various forums to these various interest groups.

23 I can't point to a specific document like  
24 this and tell you this was issued on such and such a  
25 date, but there have been many, many, many discussions



1 and meetings with interest groups across the country  
2 over the last three years dealing with this very issue,  
3 the current status of the evaluation, the latest of  
4 which, I might say, was our presentation of preliminary  
5 results from the Saskatchewan analysis of the Canadian  
6 Farm Operator Mortality Study to the Canadian Public  
7 Health Association in June of this year.

8 Although that was not a study of 2,4-D  
9 per se, it was a study in a province which uses more  
10 2,4-D than any other in the country; in fact, I believe  
11 it would be correct to say more 2,4-D than the rest of  
12 the country combined, and that information was made  
13 public in June of this year and there is a manuscript  
14 currently in the hands of the National Cancer Institute  
15 which is under evaluation and peer review for  
16 publication.

17 So I think the sum total of what I'm  
18 trying to tell you is, there has been many attempts at  
19 communicating the revised status of these studies over  
20 the last three years.

21 MRS. KOVEN: Are you in any way  
22 discontent with using Agriculture Canada as your -- the  
23 voice of the work that your group does?

24 DR. RITTER: I don't know how to answer  
25 that. I don't know if I really would like to answer as



1 to whether or not I'm content.

2 It's the lawful mechanism, that we have  
3 communicated periodically with provincial health  
4 colleagues directly. For example, in this case, as Mr.  
5 Castrilli has alluded, there was a communication that  
6 went directly from the Department of Health and Welfare  
7 to provincial health authorities. It's not a mechanism  
8 we use frequently. I'm not sure -- I can't even  
9 comment on whether or not it's a proper mechanism in  
10 the context of pesticides, and I would prefer not to  
11 comment at all as to whether or not I'm content with  
12 the vehicles that exist.

13 MRS. KOVEN: In terms of the forestry  
14 sector though, do you think that there would be an  
15 interest among that group to communicate directly with  
16 you?

17 DR. RITTER: There has been extensive  
18 communication with regards to the forestry sector, in  
19 particular, in the Health Protection Branch. Erroll  
20 Caldwell who is the program manager responsible for  
21 herbicide application for the Canadian Forestry  
22 Service - I should correct that, they are now a  
23 Ministry of State for Forestry - is a member of CAPCO.

24 So Mr. Caldwell would certainly be aware  
25 of the most contemporary developments in the evaluation

1 of the continuing submission of 2,4-D.

2 The most recent meeting incidentally of  
3 this group was held in May of this year and I think it  
4 would be fair to say that I don't think there has been  
5 a CAPCO meeting since 1985 at which 2,4-D was not on  
6 the agenda.

7 MRS. KOVEN: With the Ontario Government,  
8 do you communicate directly with Natural Resources or  
9 are your communications through the Ministry of Health?

10 DR. RITTER: They are through the  
11 Department of Health. We communicate with a number of  
12 people in the Ministry of Health, including the Chief  
13 Medical Officer of Health for the Province of Ontario.

14 We communicate formally with the Ministry  
15 of the Environment through the Secretariat of the  
16 Ontario Pesticides Advisory Committee and the Chairman  
17 of that committee and communicate less formally, if you  
18 like, with the Ministry of Natural Resources.

19 That is, I certainly had the opportunity  
20 to meet with people like Dr. Campbell, who is no longer  
21 with the Ministry but was at that time, and others who  
22 are involved with Ministry operations at regular  
23 intervals which provides us with an opportunity to  
24 discuss issues of common interest.

25 MRS. KOVEN: So if you had a concern

1 about the pesticide use in the forestry industry, who  
2 would be the person or the group that you would get in  
3 touch with at Natural Resources?

4 DR. RITTER: My first line of attack  
5 would probably be the Ministry of the Environment as  
6 the regulatory agency in Ontario. I would see it to be  
7 their primary responsibility to communicate that  
8 message and we would certainly, less formally,  
9 communicate it to a variety of staff.

10 THE CHAIRMAN: Dr. Ritter, one follow-up.  
11 You mentioned that as a result of this Agriculture  
12 Canada notice going out to the provincial agencies that  
13 you feel that -- or your agency fielded that a lot of  
14 the feedback or the calls from those who might be  
15 potentially affected?

16 DR. RITTER: That's correct.

17 THE CHAIRMAN: What would the response be  
18 of your agency, or was there an official line given to  
19 people who called up that might start off by saying:  
20 We received this memo that seems to indicate that you  
21 regard 2,4-D as a human carcinogen. What would your  
22 reply to those inquiries, if there were such inquiries,  
23 have been?

24 DR. RITTER: As I'm sure you can  
25 anticipate, like other government agencies, there are

1 delegated spokespeople on key issues which are expected  
2 to generate controversy.

3 I had the pleasure of having been  
4 designated as that spokesperson for 2,4-D, a position I  
5 guess which I still continue to enjoy.

6 The response that I provided then and  
7 would continue to provide today is that I'm unaware of  
8 the basis on which that statement would have been  
9 written and that the evidence available to us would not  
10 support the conclusion that 2,4-D should be seen as a  
11 human carcinogen

12 We did advise and would continue to  
13 advise at this time that we have not completed our  
14 evaluation of the potential hazard of 2,4-D and, while  
15 we feel that the evidence available to us does not  
16 suggest that we need take restrictive regulatory action  
17 at this time, we do feel that prudence is in order and  
18 that where uses may not be essential that they should  
19 perhaps be reconsidered.

20 That has been essentially the message  
21 that I've been delivering for the last four years or  
22 so.

23 THE CHAIRMAN: And would any of those  
24 messages or that message have been put in writing back  
25 to anybody who inquired, or is it all done orally?



1 DR. RITTER: No. There was - I can think  
2 of one recent incident - and, again, we are going to  
3 have difficulty with confidentiality - where I was  
4 approached by the Minister of - I don't want to get his  
5 title wrong - I think the Minister of Environment,  
6 Parks and Recreation for the Province of New Brunswick  
7 in which he asked that I provide him with our most  
8 current assessment of the status of 2,4-D.

9 That was in regards incidentally to an  
10 injunction hearing in New Brunswick on 2,4-D very  
11 recently, as you may be aware. I provided that  
12 assessment. And it is essentially what I have just  
13 told you.

14 Again, I have no difficulty in making  
15 that letter available in view of the fact that it was  
16 between the Minister of National Health and Welfare and  
17 the responsible Minister in the Province of New  
18 Brunswick.

19 I have to be candid, I have my doubts  
20 that that is releaseable, but I'm preapred to explore  
21 that if you find -- I have given you, in essence, what  
22 the letter said. If the hard copy would be useful, I  
23 have no trouble in trying to pursue its release.

24 MR. MARTEL: Was this document made  
25 public, the Exhibit 756?



1 DR. RITTER: Yes.

2 MR. MARTEL: It is a public document?

3 DR. RITTER: Well, it is a public  
4 document when it goes to CAPCO, there is nothing  
5 confidential about CAPCO. It was public in September  
6 of 1986. They -- I'm sorry.

7 MR. MARTEL: It would have been  
8 interesting then with two different opinions by the  
9 users, one saying it use and one saying somewhat the  
10 opposite.

11 It would have proved interesting to the  
12 user groups that you have one group saying it was and  
13 the other saying it wasn't. If there wasn't cynicism  
14 before there would have been after that.

15 DR. RITTER: I think you are right, and I  
16 think there is a message perhaps at least for us in all  
17 of this and; that is, there may be better ways to do  
18 this kind of thing.

19 I should also add that not only did we  
20 write to the Provincial Minister responsible for  
21 regulation of pesticides in New Brunswick, there have  
22 been a number of requests that have come in from other  
23 regulatory authorities including municipal authorities  
24 as to the current status of 2,4-D and in every case  
25 what I have provided them with is our summary of the

1 Canadian Farm Operator Mortality Study where the  
2 request has come in after that work was completed and  
3 our current conclusion, if you like, as to the status  
4 of the 2,4-D cancer studies.

5 And those letters are, in essence, what I  
6 have indicated to you here this morning.

7 THE CHAIRMAN: Okay.

8 MS. CRONK: Excuse me, Mr. Chairman, I  
9 was going to rise a few moments ago in respect of Mrs.  
10 Koven's question, to the extent it may be of  
11 assistance.

12 Could I just remind the Board of the  
13 existence of Exhibit 720 before you which is the Press  
14 Release issued by the Ontario Ministry of Environment  
15 dealing with this subject and the communication between  
16 the users groups, including those we represent, in that  
17 fashion.

18 THE CHAIRMAN: Thank you. When do you  
19 think it would be convenient, Mr. Castrilli, I know we  
20 have taken up a lot of your time, to break for lunch?

21 MR. CASTRILLI: If I go much further we  
22 will be into another major area.

23 Frankly, perhaps we could break for lunch  
24 right now and just keep it to an hour.

25 THE CHAIRMAN: Very well. We'll return

1 in one hour.

2 Thank you. That will be a quarter after  
3 one.

4 ---Luncheon recess taken at 12:15 p.m.

5 ---On resuming at 1:20 p.m.

6 THE CHAIRMAN: Thank you. Be seated,  
7 please.

8 DR. RITTER: Mr. Chairman?

9 THE CHAIRMAN: Yes.

10 DR. RITTER: Again, I have pursued some  
11 of my homework assignments and I have a couple of other  
12 things to now submit. I would like to very quickly  
13 introduce them. There were three things at least which  
14 were discussed this morning and I'll deal with the  
15 simplest first.

16 The correspondence between the Minister  
17 of National Health and Welfare and the responsible  
18 Minister in the Government of New Brunswick, we have  
19 now identified that letter and I have requested the  
20 Minister's Office in Ottawa to determine from the  
21 Minister in New Brunswick if there would be any  
22 objection to release of that letter.

23 As a matter of record, our position is  
24 that we would favour its release and we have so  
25 indicated or will be so indicating to the Minister

1 responsible in New Brunswick.

2 As I'm sure all parties here can  
3 understand, the ultimate decision as to its  
4 releasability is really in the hands of the recipient,  
5 the Minister of New Brunswick, so we leave it to his  
6 discretion as to whether or not that letter will  
7 ultimately be released, and I will provide you with an  
8 answer to that as soon as it is given to me.

9 THE CHAIRMAN: Thank you.

10 DR. RITTER: With regards to the  
11 contaminants in Canadian human tissues, as I indicated  
12 to you there had been more recent work done, it was  
13 published in 1988 in a chemistry journal. That article  
14 is now being photocopied and will be distributed in the  
15 next few moments.

16 But just by way of introduction, let me  
17 say that this most recent piece of work, the 1988 work,  
18 was an analysis of various contaminants in autopsy  
19 tissue obtained from six Ontario municipalities and, in  
20 essence, what the work concluded is that there was no  
21 statistical difference in the levels of these  
22 contaminants between the six communities and that the  
23 levels found in the six communities were representative  
24 of values reported within other jurisdictions.

25 From that the authors have concluded that

1 it is entirely likely that the contaminant levels that  
2 have been noted have probably occurred from dietary  
3 exposure; that is, because the levels are common  
4 regardless of community and because the food supply  
5 tends to be the constant as one moves across a  
6 jurisdiction, it's likely that that is the source of  
7 the contamination. That will be distributed in the  
8 next couple of moments.

9 The third item relates to the summary  
10 which I indicated I would provide on the study  
11 conducted on our behalf at Bio Research Laboratories  
12 and that summary is also now being photocopied and will  
13 be distributed.

14 And, again by way of introduction, as I  
15 indicated, we were prompted to do that study in order  
16 to investigate the bio-equivalence between at least two  
17 forms of 2,4-D. We had information already on one  
18 form; namely, the acid, so that this study deals with  
19 another form.

20 It's a 28-day sub-chronic feeding study  
21 in rats in which we requested Bio Research Laboratories  
22 to investigate a number of common bio-chemical and  
23 haematology parameters in order that we might determine  
24 if there were significant biological differences in the  
25 response following exposure to one form of 2,4-D as



1 compared to the other.

2 And the conclusion of that report was  
3 that there were essentially no effects attributable to  
4 the ingestion of 2,4-D in that form, which were similar  
5 to the conclusions of the other form of 2,4-D.

6 In other words, we were unable to  
7 establish that there was any difference, at least in  
8 the context of this study, between the two forms of  
9 2,4-D which had been administered which, in part, led  
10 us to the conclusion that there is a rational basis for  
11 concluding bio-equivalency of these forms.

12 I am going to distribute that -- or at  
13 least the summary will be distributed and I would ask  
14 for your guidance as to whether or not it's essential  
15 that the full document be made available, not that  
16 there is any conflict in making it available, but  
17 simply because it's rather lengthy. It would be a...

18 THE CHAIRMAN: Well, I think in view of  
19 the fact that we are going to put forward the summary,  
20 it's practice to have one copy of the full document  
21 available for those counsel and/or the Board to view it  
22 if they so wish.

23 DR. RITTER: May I make that available to  
24 Ms. Murphy?

25 THE CHAIRMAN: Yes.

1 Mr. Castrilli?

2 MR. KINGSBURY: Mr. Chairman, I also have  
3 one undertaking I could report on at this time.

4 THE CHAIRMAN: Very well.

5 MR. KINGSBURY: Mr. Castrilli asked me  
6 yesterday if I could provide, through Agriculture  
7 Canada, basically a current listing of what, if any,  
8 data gaps pertinent to evaluation of the registration  
9 additions for forestry uses of glyphosate exist in the  
10 environmental fate data Agricultural Canada has, and I  
11 have received a telex or a fax from the evaluation  
12 officer responsible for the evaluation of glyphosate.

13 He indicates that there are three  
14 problems at the moment with indicating -- with  
15 providing that information: One, their computer system  
16 is down; secondly, their registry is closed due to  
17 reconstruction. He also says he would have to obtain  
18 agreement from the data owner to provide that data. He  
19 indicates that he will -- if that permission is  
20 forthcoming, he will provide that information as soon  
21 as possible.

22 DR. RITTER: I have one last point, Mr.  
23 Chairman, with regards to the contaminant levels in  
24 2,4-D.

25 I had indicated that I would endeavour to

1 determine if more recent reports are available and we  
2 are in the midst of doing that, but I have been advised  
3 as to the current status of those monitoring programs  
4 and, if I may, it's just four or five lines, I'll read  
5 directly from the advice that I've been given.

6 This is from a member of my staff to me  
7 following that request:

8 "I spoke to Joe Singh this morning, he  
9 referred me to Jim Reid for summary of  
10 2,4-D dioxin monitoring results. J.  
11 Reid will be in his office only this  
12 p.m. Singh said that their limit of  
13 detection is 1 part per billion. At  
14 that limit of detection they have never  
15 found 2,3,7,8-TCDD in either the  
16 precursor material; namely,  
17 2,4-dichlorophenol or in 2,4-D.  
18 Moreover, they never found the  
19 trichlorophenol precursors required  
20 for the formation of 2,3,7,8-TCDD."

21 And I'm optimistic that later on today I  
22 will actually be able to provide you with hard copy of  
23 monitoring results.

24 THE CHAIRMAN: Thank you.

25 MR. CASTRILLI: Q. Dr. Ritter, we were

1 speaking this morning of the NCI Kansas study which is  
2 now Exhibit 754.

3 DR. RITTER: A. Yes.

4 Q. I understand since the publication of  
5 this document there have been a number of additional  
6 studies and also there have been additional  
7 epidemiology studies in this area, and also there have  
8 been a number of reinterpretations or further  
9 interpretations of the NCI study itself. Is that  
10 right?

11 A. I would agree with your earlier  
12 statements. I think as far as reinterpretations are  
13 concerned, there have been a number of critiques, if  
14 you like. Nobody has actually undertaken a  
15 re-evaluation, per se, of the data used in the Kansas  
16 study that I'm aware of but, rather, an evaluation of  
17 the conclusions if you like, a critique of the  
18 protocol.

19 Q. So, in other words, there have been  
20 reinterpretations but not re-evaluations?

21 A. That's correct.

22 Q. Okay. Just if I could summarize, I  
23 think perhaps the best summary that I'm aware of for  
24 the purposes of this discussion is at page 15 of  
25 Exhibit 748.

1 A. Yes.

2 Q. Sorry, Exhibit 748 is the  
3 reregistration document for 2,4-D. Just reading parts  
4 of the first two paragraphs under the heading: Human  
5 Exposure, Epidemiology:

6 "In a population-based case control study  
7 conducted by the National Cancer  
8 Institute in Kansas (NCI), a relationship  
9 was found between farm herbicide use..."

10 Vis-a-vis phenoxy herbicides generally:

11 "...and non-Hodgkin's lymphoma but not  
12 between herbicide use and soft-tissue  
13 sarcoma or Hodgkin's Disease."

14 And continuing:

15 "Although the Agency has concluded that  
16 this study was well conducted and served  
17 as a good basis for a hypothesis of a  
18 non-Hodgkin's lymphoma and phenoxy  
19 herbicide association, the Agency has  
20 concerns about the study..."

21 And the agency goes on to note I guess  
22 the principal ones:

23 "Some of the key areas of concern are  
24 lack of appropriate controls, exposure to  
25 multiple chemicals and insufficient



1 information on actual exposure to 2,4-D."

2 Dr. Ritter, in your experience, does that  
3 summarize what is now the scientific view with respect  
4 to what is now Exhibit 754?

5 A. Yes.

6 Q. And also, really subsequent to the  
7 publication of Exhibit 754, there were additional or  
8 there have been additional epidemiology studies  
9 performed by the National Cancer Institute.

10 One I am aware of is actually, I think,  
11 referred to in the next -- sorry, the last sentence in  
12 the second paragraph on page 15, a study on 2,4-D by  
13 use in relation to farmers in the state of Washington  
14 which did not confirm the Kansas study conclusions; is  
15 that right?

16 A. Yes.

17 Q. And in part because of -- and just in  
18 relation to that Washington study, has your department  
19 reviewed that study?

20 A. I believe that our staff  
21 epidemiologists have, yes.

22 Q. Do they essentially concur with the  
23 conclusions set out at page 15?

24 A. I believe that's correct. I'm  
25 qualifying my answer just a little bit, Mr. Castrilli,

1       because, as you know, I do not purport to be an  
2       epidemiologist and we generally leave the hard  
3       evaluation of epidemiology studies to our staff  
4       epidemiologist.

5                       So the answers I will endeavour to give  
6       you are as accurate as I can give you, given that  
7       qualification.

8                       Q.   That's fine.  I'm just really  
9       interested in the department's position, if you know  
10      it.

11                      A.   Yes, I think that's correct.  I think  
12      that reflects the department's position.

13                      Q.   And the -- just again in relation to  
14      Exhibit 754, the sentence after the line that ends:

15                      "Exposure to 2,4-D..."

16                      The U.S. EPA notes:

17                      "Because of these numerous areas of  
18      uncertainty..."

19                      And that's in relation to the Kansas  
20      study:

21                      "...the Agency has not finalized its  
22      position regarding 2,4-D as the causative  
23      agent in the non-Hodgkin's lymphoma  
24      cases."

25                      Is that, relatively speaking, the

1 position of Canada as well?

2 A. Yes.

3 Q. Yes. Is that -- to your knowledge,  
4 Dr. Ritter, is this summary to your knowledge  
5 comprehensive as to what was known generally in the  
6 fall of 1988 in relation to the epidemiology studies on  
7 2,4-D?

8 A. The paragraph that you've read from,  
9 Mr. Castrilli, is not a summary of epidemiology studies  
10 on 2,4-D, it's a summary essentially of one study on  
11 2,4-D.

12 There have been numerous studies which I  
13 would say are of relevance to the evaluation of the  
14 epidemiologic evidence with regards to phenoxyacetic  
15 acids or herbicides in general and cancer, and this  
16 paragraph deals essentially with only one.

17 There are more exhaustive reviews of this  
18 subject in general, one of which I can --

19 Q. Is Exhibit 714 the one you are  
20 referring to? That has a summary in it, as I recall.

21 A. Exhibit 714 is...?

22 Q. Sorry, the expert panel report on  
23 2,4-D.

24 A. That's one of them. There is a much  
25 more recent 1989 publication which would include

1 information not reviewed in the Ontario Task Force and  
2 that is...

3 Q. Is that another exhibit you're  
4 thinking of?

5 A. It's not an exhibit. It's an article  
6 entitled: Phenoxy Herbicides and Cancer, Insufficient  
7 Epidemiologic Evidence for a Causal Relationship. It  
8 is authored by Gregory G. Bond and others.

9 MS. CRONK: That is an exhibit, Dr.  
10 Ritter.

11 DR. RITTER: I'm sorry, I beg your  
12 pardon.

13 MR. CASTRILLI: Is it Exhibit 715?

14 DR. RITTER: Exhibit 715.

15 MS. CRONK: I will just confirm that.

16 DR. RITTER: I would say that that  
17 represents the most recent review of all of the studies  
18 that I'm aware of dealing with this subject.

19 MR. CASTRILLI: Mr. Chairman, I believe  
20 it is Exhibit 715.

21 THE CHAIRMAN: Thank you.

22 DR. RITTER: As a matter of record, Mr.  
23 Castrilli, that's published in 1989.

24 MR. CASTRILLI: All right.

25 Q. Dr. Ritter, it was received in

1 September, 1987 and accepted for publication in June,  
2 1988; is that right?

3 DR. RITTER: A. Yes, that's noted on the  
4 top of the manuscript.

5 Q. So that it would really be accurate  
6 to no later than June of 1988?

7 A. I suspect it's accurate to some date  
8 earlier than that, but perhaps somewhere around there.

9 Q. All right, thank you. Are you aware  
10 of epidemiology studies performed again by the U.S.  
11 National Cancer Institute in Nebraska that essentially  
12 confirm the earlier findings in Kansas with respect to  
13 increased risk of non-Hodgkin's lymphoma associated  
14 with farm occupational use and exposure of 2,4-D?

15 A. I'm aware of the study, Mr.  
16 Castrilli, but I'm not sure that I'm prepared to agree  
17 with the latter part of your sentence and; that is,  
18 that it confirmed earlier observations in Kansas.

19 If I may, I would just like to expand on  
20 that answer very briefly.

21 THE CHAIRMAN: Are you going to enter it?

22 MR. CASTRILLI: I'm going to enter what I  
23 understand exists with respect to it at this point,  
24 which is just an abstract published in 1989.

25 I understand the research findings have



1 not yet been published and will not be for at least six  
2 months, but there is a summary of it prepared by the  
3 authors.

4 THE CHAIRMAN: All right. Do you want to  
5 enter what you have and then we will go on from there?

6 MR. CASTRILLI: Yes. It will be easier  
7 to do it that way. Mr. Chairman, that would be  
8 exhibit...?

9 THE CHAIRMAN: 758.

10 MR. CASTRILLI: Dr. Ritter, you have a  
11 copy of the abstract; is that right?

12 DR. RITTER: Yes, I do.

13 MR. CASTRILLI: (handed)

14 THE CHAIRMAN: Thank you.

15 MR. CASTRILLI: Mr. Chairman, the title  
16 of this article -- or excuse me, the title of this  
17 abstract is: A Case Control Study of non-Hodgkin's  
18 Lymphoma and Agricultural Factors in Eastern Nebraska.  
19 The authors are some of the same people who did the  
20 Kansas study in 1986.

21 I'm just going to read one or two parts  
22 of it and then ask Dr. Ritter to comment.

23 ---EXHIBIT NO. 758: Abstract entitled: A Case Control  
24 Study of non-Hodgkin's Lymphoma  
25 and Agricultural Factors in  
Eastern Nebraska.

1 MR. CASTRILLI: Q. The abstract begins:

2 "A recent study conducted in Kansas  
3 reported a sixfold excess risk of  
4 non-Hodgkin's lymphoma (NHL) among  
5 farmers exposed to agricultural  
6 herbicides 20 or more days per year. To  
7 further investigate the association  
8 between NHL and agricultural factors, a  
9 population-based case-control study was  
10 conducted in Eastern Nebraska."

11 And then just dropping down one sentence,  
12 the article notes -- the abstract notes:

13 "Exposure to 2,4-D more than 20 days/  
14 year increased risk 3-fold."

15 Now, Dr. Ritter, let me just ask you:

16 Does in your view - granted you only have the  
17 abstract - does this confirm the findings in Kansas  
18 which included at the time of view that there was an  
19 association between exposure to 2,4-D an increased risk  
20 of 2,4-D -- an increased risk of non-Hodgkin's lymphoma  
21 or, if not, what are the differences and discrepancies  
22 in your view?

23 DR. RITTER: A. I should say, by way of  
24 introduction, Mr. Castrilli, that I was invited to  
25 visit with staff of the National Cancer Institute at

1 the time that this manuscript was being prepared for  
2 the purpose of discussions in areas of mutual interest.

3 As I indicated to you, Dr. Blair has been  
4 a collaborator of ours for some years.

5 In attempting to answer your question I  
6 will be as brief as possible, but I first have to make  
7 reference to the Kansas study because it is the basis  
8 for the comparison in the Nebraska study.

9 The Kansas study, as you noted in the EPA  
10 review, was considered to be flawed at least in one  
11 regard with regards to exposure indices.

12 And what we mean by that is: I have gone  
13 to some length, at least during the course of my  
14 testimony, to explain that while toxicology, as an  
15 intrinsic principle of a chemical, is in itself  
16 interesting it's not very informative until one has a  
17 measure of exposure to the toxic insult. So that an  
18 agent which could be a very potent carcinogen may not  
19 constitute any human risk whatsoever if there's no  
20 exposure.

21 That's critical in the case of the Kansas  
22 study because it was that very measure of exposure  
23 which was considered one of its weakest features; that  
24 is, the authors -- and I should very quickly add that I  
25 do not mean this in any way to be critical of the

1 Kansas study, it was a feature of the way in which the  
2 study had to be conducted, it in no way reflects on the  
3 abilities of the authors.

4 The exposure measurments were by far and  
5 away among the weakest features of that study, and what  
6 that meant at the end of the day was that it was very  
7 difficult to establish a relationship between actual  
8 exposure to 2,4-D or, indeed, to any chemical  
9 investigated in the Kansas study and outcomes, such as  
10 non-Hodgkin's lymphoma.

11 Because of the essential importance of  
12 that exposure measure, this study was subsequently  
13 considered by many to be useful for the purpose of  
14 generating further studies but, in itself, perhaps not  
15 all that useful in establishing any causal  
16 relationships.

17 The reason I say that, Mr. Castrilli, is  
18 because in the Nebraska study some of these  
19 deficiencies were corrected and, in that regard, there  
20 is a number of interesting contrasts and comparisons  
21 that we can make between the two.

22 For example, whereas in the Kansas study  
23 where exposure can only be estimated very poorly there  
24 was a sixfold statistically significant increase in  
25 non-Hodgkin's lymphoma; in the Nebraska study where



1       there was a much better measure of exposure, the  
2       increase was no longer statistically significant and  
3       fell from sixfold to threefold.

4               So that, in other words, as the precision  
5       of exposure indices increased the risk apparently  
6       decreased in comparison to the Kansas analysis.

7               I'm not going to attempt to suggest to  
8       you that that either contradicts or confirms the Kansas  
9       observations; I'm simply going to suggest to you that  
10      they're quite different from the Kansas observations  
11      and that the variable is a precision of exposure  
12      measurments and that's an area to which I would attach  
13      a great deal of importance for the reasons that I've  
14      indicated.

15              I could go on to some of the other areas,  
16      but essentially that's really the impression that I  
17      would like to leave with you, that at least until - and  
18      perhaps not even then - the full manuscript is  
19      available within the peer-reviewed literature - and you  
20      are quite correct in your statement that it is in  
21      preparation for publication - I think it would be  
22      difficult to draw a conclusion as to whether or not  
23      this necessarily confirms the Kansas observation.

24              I think it's important to note, as I have  
25      indicated, that this study does not achieve statistical



1       significance, whereas the Kansas did; and this study  
2       reports a risk which is approximately only half of what  
3       was reported in the Kansas study.

4               THE CHAIRMAN: Dr. Ritter, just to get it  
5       clear, why is the Nebraska study not statistically  
6       valid as you indicated the Kansas study was?

7               DR. RITTER: There can be several reasons  
8       for why that may occur and, from the kinds of  
9       information that's available here, it would be  
10      difficult really to determine that.

11              It can be because the number of cases is  
12      too small; that is, the rigor of statistical  
13      mathematics requires group size of some magnitude  
14      before statistical inferences can be made from that  
15      data, and there may simply not have been enough cases.

16              On the other hand, there may also be too  
17      much spread within the data; that is, the results may  
18      be too variable to allow for a statistically different  
19      relationship to be established between any two given  
20      sets of results.

21              Given the number of cases; that is,  
22      1,432, histologically confirmed cases of NHL in the  
23      Nebraska study, without the benefit of a full  
24      manuscript I would almost venture a guess that the  
25      number of cases did probably not contribute in any

1 significant way -- I shouldn't use the word  
2 significant - did probably not contribute to the  
3 inability to achieve statistical significance, that's a  
4 good number of cases.

5 But I hasten to add that to really answer  
6 that question properly one would need the full data  
7 set. That would become evident from a much larger data  
8 set.

9 THE CHAIRMAN: Thank you.

10 MR. CASTRILLI: Q. Dr. Ritter, just for  
11 my clarification. At page 15 of Exhibit 748, the third  
12 paragraph under epidemiology studies, the second  
13 sentence, EPA notes that:

14 "The NCI has two other epidemiology  
15 studies underway which will assess  
16 herbicides in general and 2,4-D  
17 specifically as to potential cancer  
18 associations."

19 To your knowledge, is the Nebraska study  
20 one of the two they are referring to?

21 DR. RITTER: A. Yes, I believe it was.

22 Q. Do you know what the other one is?

23 A. When I met with the Science Advisory  
24 Panel there was some discussion of a study underway  
25 under the auspices of the National Cancer Institute

1 that dealt with applicators who would have been exposed  
2 primarily and, in some cases exclusively, to 2,4-D and  
3 that was being examined in an attempt to eliminate the  
4 confounding factors present with mixed exposures to  
5 which there is some reference in that middle paragraph  
6 that you are reading from.

7 Q. Is that another State-based study, or  
8 do you know?

9 A. No. Actually I believe it was a  
10 study based on rights-of-way applicators from utility  
11 companies across the United States carefully selected  
12 to ensure that exposure would have been primarily to  
13 2,4-D.

14 Q. And do you have any idea, if you  
15 know, the status of that study, whether it is in  
16 pre-publication form or is it at an earlier stage?

17 A. When I last met with the Science  
18 Advisory Panel about 15 months ago on that topic, the  
19 study had not yet been initiated. In fact, it was not  
20 even clear if funding had been secured for it.

21 Q. Dr. Ritter, I won't ask you any  
22 further questions with respect to 758. I think you've  
23 indicated that there really is not enough there for you  
24 to comment on meaningfully; is that right?

25 A. To the extent that the information is

1 here I have attempted to assist you in comparing and  
2 contrasting the results in this abstract with those  
3 reported for Kansas.

4 If you have questions, I'd be delighted  
5 to try and answer them; if I can't, I will so indicate.

6 Q. Well, let me just ask you: Will the  
7 Nebraska study when it is published be considered by  
8 Canada in its ongoing evaluation of 2,4-D use in  
9 Canada?

10 A. Oh, there is absolutely no question.  
11 In fact, we will be apprised of the results before they  
12 are published, and I would expect that if implicated we  
13 will certainly take action regardless of the  
14 publication status of that manuscript.

15 MRS. KOVEN: Excuse me, Dr. Ritter, this  
16 is just a question out of interest. I don't know what  
17 the incidence of NHL is in Kansas or Nebraska, but are  
18 the sample sizes very small compared to the incidence  
19 in the population?

20 DR. RITTER: Yes. NHL has a background  
21 incidence throughout North America. It varies a little  
22 bit -- it varies more than a little bit between rural  
23 and urban centres. The incidence of non-Hodgkin's  
24 lymphoma has been increasing steadily throughout North  
25 America over the last 13 to 15 years, starting from a



1 low around 1969 of about 4 cases per 100,000 to about  
2 15 cases per 100,000 in 1983 in highly industrialized  
3 metropolitan centres.

4 There has been a similar rate of increase  
5 in rural centres, but much less dramatic and some  
6 authors have argued that that would tend to support a  
7 hypothesis of a significant viral component in the  
8 etiology. And I'm just going to very quickly expand on  
9 that because you've asked the question.

10 The possibility of viral mediation in  
11 lymphoid tumors in particular is well established in  
12 the literature and the two examples that I would give  
13 you are Burkett's lymphoma, which is known to be caused  
14 by a virus, and Carposi sarcoma, which is the tumor  
15 associated with AIDS, both of which are mediated  
16 through virus infection.

17 Where there is a viral component to the  
18 etiology of these diseases, because of the way in which  
19 viruses are expected to spread, one would expect that  
20 the rate of increase should be more dramatic in  
21 geographic regions that favour the spread of infectious  
22 disease such as industrialized urban centres, and the  
23 available information on non-Hodgkin's lymphoma is  
24 consistent with that kind of a working hypothesis for a  
25 viral component.



1                   So although I'm not aware of any evidence  
2                   that would directly link a viral component in the  
3                   etiology of non-Hodgkin's lymphoma, the available  
4                   evidence does suggest that that's a plausible  
5                   hypothesis.

6                   And in the final analysis, as I  
7                   indicated, the overall background rate presently in  
8                   North America, urban and rural centres taken together,  
9                   is roughly between 12 and 15 cases per 100,000.

10                  Q. Dr. Ritter, Ms. Cronk introduced  
11                  Exhibit 715 which was the article you referred to a  
12                  moment ago: Phenoxy Herbicides and Cancer,  
13                  Insufficient Epidemiologic Evidence for a Causal  
14                  Relationship. It's authored by three members of the  
15                  Department of Epidemiology and Health and Environmental  
16                  Sciences at Dow Chemical Company.

17                  Do you recall that discussion?

18                  A. I must be honest, I don't.

19                  Q. All right. Let me just take you to  
20                  the conclusions which appear in the abstract. The  
21                  conclusion was -- and, Dr. Ritter, I'm reading from  
22                  really the last sentence on that page -- sorry, the  
23                  last sentence in the abstract.

24                  THE CHAIRMAN: Do you want to wait a  
25                  moment until we get it?

1 MR. CASTRILLI: Yes, I was going to.

2 THE CHAIRMAN: Okay.

3 MR. CASTRILLI: Q. Just reading from the  
4 abstract, the last sentence.

5 THE CHAIRMAN: Sorry, what page?

6 MR. CASTRILLI: The first page.

7 THE CHAIRMAN: Thank you.

8 MR. CASTRILLI: Q. The abstract notes:  
9 "The total weight of evidence currently  
10 available does not support a conclusion  
11 that the phenoxy herbicides present a  
12 carcinogenic hazard to humans."

13 Dr. Ritter, I don't recall now, did you  
14 agree with that assessment?

15 DR. RITTER: A. Yes.

16 Q. Are you aware of any reported cancer  
17 deaths attributable to 2,4-D?

18 A. I want to be sure I understand your  
19 question very clearly. Am I aware of authors or  
20 investigators who, in their words, have reported an  
21 association between 2,4-D and cancer, or would I agree  
22 that, or is it my opinion that there are reports  
23 linking 2,4-D and cancer in humans?

24 I'm not sure which question you are  
25 asking.

1 Q. Let me restate the question and see  
2 if it seems clearer on second listening? Are you aware  
3 of any cancer deaths, from whatever sources,  
4 attributable to 2,4-D?

5 A. I'm going to answer that as no.

6 Q. Are you aware of a 1987 \$1.5-million  
7 jury verdict upheld on appeal in April 8, 1989 in the  
8 State of Texas which found Dow Chemical liable for the  
9 cancer death of a U.S. forest service worker from  
10 exposure to 2,4-D?

11 A. I'm aware that that legal - I don't  
12 know what the word is - I'm aware that that trial took  
13 place in Texas. I have not reviewed the transcript of  
14 the trial and I really can't comment on the conclusion  
15 which the court reached in that particular case,  
16 particularly because, as you are aware, much of this  
17 decision was based on the way in which Texas law views  
18 liability and it's not entirely a biological argument.

19 I think that is what I'm trying to say,  
20 there are significant components of law in that  
21 argument and liability and responsibility which may or  
22 may not have anything to do with the science of 2,4-D.

23 Q. Are you aware that the finding of the  
24 jury and and the upholding of the decision on appeal  
25 was that cancer death was caused from exposure to

1 2,4-D?

2 A. I have indicated to you as best I  
3 can, Mr. Castrilli, that's a legal battle not a  
4 scientific one and, as Mr. Justice Nunn I think  
5 indicated in his decision in Nova Scotia, a court  
6 cannot determine the safety of anything, at least not  
7 in Canada and, in that context, I find it difficult to  
8 answer your question.

9 I have not reviewed the transcript of  
10 that trial, I was not present at that trial and that  
11 trial in Texas has not given rise to any action in  
12 Canada.

13 Q. Have you been provided with a copy of  
14 the jury verdict and the Court of Appeal decision by  
15 your counsel?

16 A. No, I have not. I requested a copy  
17 of that jury decision actually from Mr. Jerry White who  
18 was acting on behalf of Sprayers of Dioxin Association  
19 of New Brunswick and Mr. White indicated that he would  
20 make a copy of that available to me because he called  
21 and said that I should be concerned about that result.

22 And I suggested to him that if he felt  
23 that there were elements in there of which I should be  
24 made aware, I would be delighted to receive it. He  
25 didn't submit it and I reminded him of his commitment

1 and he didn't submit it again. So I do not have a copy  
2 of it.

3 MR. CASTRILLI: Mr. Chairman, I made a  
4 copy of the jury verdict and the decision of the Court  
5 of Appeal available to Ms. Murphy on Tuesday night when  
6 I received it and I asked that she make it available to  
7 Dr. Ritter.

8 Can she advise the Board whether she did  
9 that or not.

10 MS. MURPHY: I can advise the Board, as I  
11 did Mr. Castrilli, at the moment that he gave it to me  
12 that I was not prepared to provide that to the  
13 witnesses at that time.

14 I just want to indicate to you right now  
15 that what I was provided with was essentially an  
16 endorsement of final judgment and a Court of Appeal  
17 decision which apparently came out April 4th, 1989.

18 I'm certainly not going to object to  
19 those documents being filed, but I did want to raise it  
20 with the Board before the witnesses were asked to  
21 comment on them given that, of course, if they are to  
22 comment on them at all, it is very important to  
23 understand whether they did have any previous  
24 understanding or knowledge about these cases at all.

25 MR. CASTRILLI: Well, Mr. Chairman, it's



1 clear that Dr. Ritter did and if Murphy had made it  
2 available to him on Tuesday night he might actually be  
3 able to talk about it.

4 But, in any event, I want to file those  
5 two documents at this point. The witness has indicated  
6 his general awareness of the subject matter.

7 MS. MURPHY: That's fine. I just would  
8 like to point out, Dr. Ritter has now said he knew  
9 something about it. I couldn't ask him that on  
10 Tuesday.

11 THE CHAIRMAN: Well, obviously, there can  
12 be no objection to the public record of a court  
13 decision being filed with the Board for whatever  
14 probative value, in the context of this case, it may  
15 have.

16 So you can file what you wish to file,  
17 Mr. Castrilli, at this time.

18 MR. CASTRILLI: Mr. Chairman, I actually  
19 have -- they are really two documents and they probably  
20 should, therefore, receive two exhibit numbers. The  
21 first one...

22 MS. CRONK: Excuse me, Mr. Chairman. I  
23 just rise on a procedural matter. I wonder if the  
24 Board really wants to make them exhibits, in the sense  
25 that...

1 THE CHAIRMAN: Well, they would form part  
2 of the jurisprudence?

3 MS. CRONK: Exactly.

4 THE CHAIRMAN: We could take judicial  
5 notice of it without having it formally on the record.

6 MS. CRONK: I say that, sir, because  
7 there would be a difficulty in my view if, depending on  
8 the nature of questions put to witnesses, if they  
9 aren't qualified legally to respond to it, and it's not  
10 of course the normal tradition to question witnesses  
11 about legal cases.

12 And I would submit to you, I had  
13 indicated to you I was going to have copies made, for  
14 example, of the Palmer Decision and give it to you.  
15 I wasn't intending to ask for an exhibit number for  
16 that.

17 I'm not objecting in any way to filing  
18 these or any other cases, if we are going to get into  
19 filing, a battle that you're going to hear with a large  
20 amount, but I just wondered if you want to be setting  
21 that precedent. As to whether you attach...

22 THE REPORTER: I'm sorry, Ms. Cronk, I  
23 can't hear you.

24 MS. CRONK: I'm sorry. I wonder whether  
25 you wish to be attaching an exhibit number to these or

1       whether you even consider that as being significant. I  
2       just thought I would raise it.

3               MR. CASTRILLI: Mr. Chairman, I would  
4       like them to be exhibits because the content,  
5       particularly of the Court of Appeal judgment, is of a  
6       scientific nature.

7               THE CHAIRMAN: Ms. Cronk, I think this  
8       may fall outside the general rule in the sense that  
9       these decisions, as the Board understands what they  
10      contain, would contain certainly pronouncements of law,  
11      but also perhaps a reasonable discussion of scientific  
12      issues.

13              It's the scientific issue part that would  
14      be relevant as evidence for comment by witnesses also  
15      qualified in those areas.

16              MS. CRONK: I don't object to it at all,  
17      sir. I just thought it might be a matter you wish to  
18      think about.

19              THE CHAIRMAN: All right. I'm not sure  
20      by filing these cases referred to by Mr. Castrilli we  
21      are going to be setting the precedent for other cases  
22      of filing legal cases. I think the distinction can be  
23      made on the basis I have just outlined.

24              Very well, Mr. Castrilli, let's file that  
25      as two numbers.

1 MR. CASTRILLI: Yes. Mr. Chairman, the  
2 first exhibit I would propose would be the United  
3 States District Court Endorsement of the Jury Verdict  
4 between Ann Greenhill and others versus Dow Chemical  
5 Company. It's dated December 7, 1987.

6 THE CHAIRMAN: All right. That will be  
7 Exhibit 759.

8 ---EXHIBIT NO. 759: United States District Court,  
9 Endorsement of the Jury Verdict,  
10 Ann Greenhill, et al vs. Dow  
Chemical Company, dated December,  
7, 1987.

11 MR. CASTRILLI: And the second document,  
12 Mr. Chairman, would be the Decision of the United  
13 States Court of Appeals for the Fifth Circuit in the  
14 State of Texas, Decision dated April 4, 1989.

15 And, Mr. Chairman, I would just note that  
16 this does not yet have a citation, although it is  
17 printed in the format normally printed by the West  
18 Publishing Company.

19 THE CHAIRMAN: That will be Exhibit 760.

20 ---EXHIBIT NO. 760: Decision of the United States  
21 Court of Appeals for the Fifth  
22 Circuit in the State of Texas,  
Decision dated April 4, 1989.

23 MR. CASTRILLI: (handed)

24 THE CHAIRMAN: Thank you.

25 MR. CASTRILLI: Mr. Chairman, just so we

1 know where we are, I'm just referring first to Exhibit  
2 759.

3 There were three questions asked and  
4 three questions answered by the jury. I just want to  
5 mention the first one, then go to the text really of  
6 the Court of Appeal judgment which has the scientific  
7 discussion.

8 The question simply asked...

9 THE CHAIRMAN: Just a moment.

10 Ms. Cronk?

11 MS. CRONK: Could I ask by way of inquiry  
12 of my friend whether this is for the purpose of, as  
13 counsel, making argument to the Board or providing for  
14 the Board a decision, per se, or is it for the purposes  
15 of cross-examination?

16 If it's the former, in my view, it's  
17 inappropriate at this time; if it's the latter,  
18 depending on the questions, it could be appropriate. I  
19 just ask for some guidance before we get too far down  
20 the road in dealing with these cases.

21 THE CHAIRMAN: Well, how did you intend  
22 to proceed Mr. Castrilli?

23 MR. CASTRILLI: Well, I simply want to  
24 set the context so I can ask the question. If Ms.  
25 Cronk will permit me to ask the question, I think it



1 will become clear that I'm simply going to be focusing  
2 on the scientific discussion that occurs really in the  
3 Court of Appeal judgment.

4 MS. CRONK: I have no trouble with the  
5 question being asked, sir, that is not what I  
6 understood what he was about to do and perhaps I was a  
7 bit premature.

8 THE CHAIRMAN: But are you going to be  
9 saying anything other than repeating what is directly  
10 in this document, Exhibit 759?

11 MR. CASTRILLI: Well, I want to ask Dr.  
12 Ritter several questions about the scientific comments  
13 that are summarized, in particular, or exclusively in  
14 the Court of Appeal judgment.

15 But to understand the situation, I think  
16 he has to know where it ended and where it began. So  
17 that is all the purpose of referring to...

18 THE CHAIRMAN: Well, let's proceed  
19 cautiously down the road and see where we go.

20 MR. CASTRILLI: Q. Dr. Ritter, I asked  
21 you before I gave you the document whether you were  
22 aware of a decision of the United States District Court  
23 which found that 2,4-D was a -- use the words  
24 properly -- there had been any reported cancer deaths  
25 attributable to 2,4-D. Your answer was no.

1                   And I gather you were not including in  
2                   your answer this incidence?

3                   THE CHAIRMAN: Well, let's go one step  
4                   further, Dr. Ritter. When you replied to that  
5                   question, were you replying in a scientific sense?

6                   DR. RITTER: Yes.

7                   THE CHAIRMAN: Or in a sense of somebody  
8                   else may have reported or indicated there was a cancer  
9                   death caused by 2,4-D but you would not accept that in  
10                  terms of your scientific knowledge?

11                  DR. RITTER: I can recall for you, Mr.  
12                  Chairman, exactly how I was made aware of this.

13                  Mr. Jerry White, as I indicated, of SODA,  
14                  Sprayers of Dioxin Association, contacted me in the  
15                  latter part of last year and indicated that there was a  
16                  trial underway with regards to this matter and that it  
17                  would convince me that 2,4-D was a carcinogen.

18                  THE CHAIRMAN: No, but we are dealing  
19                  with your answer today. Presumably you would have  
20                  known about this decision before today.

21                  DR. RITTER: I knew that the trial had  
22                  taken place.

23                  THE CHAIRMAN: Oh, you did not know the  
24                  result of the decision?

25                  DR. RITTER: I did not know the result of

1 the decision, no.

2 THE CHAIRMAN: Did not this conversation  
3 with Mr. White take place before today?

4 DR. RITTER: Yes, but not at the time  
5 that all of the various legal procedures had been  
6 completed. When I spoke to Mr. White the trial was  
7 underway.

8 THE CHAIRMAN: Oh, I see. So there  
9 hadn't been a verdict rendered?

10 DR. RITTER: There hadn't been a verdict  
11 rendered, no.

12 THE CHAIRMAN: So up until this was  
13 produced to you right now--

14 DR. RITTER: That's right.

15 THE CHAIRMAN: --you were not aware of  
16 the fact that at least somewhere somebody is, in this  
17 case a jury verdict in the Court of Appeal decision -  
18 indicating that there was some causal/relationship  
19 between death and 2,4-D?

20 DR. RITTER: Yes.

21 THE CHAIRMAN: Okay.

22 MR. CASTRILLI: Mr. Chairman, let's turn  
23 to the Court of Appeal judgment.

24 Q. Dr. Ritter, in your discussions with  
25 Mr. White, did you -- sorry, I'm referring to page 2727

1 of the Court of Appeal judgment?

2 DR. RITTER: A. Yes.

3 Q. Of what is now Exhibit 760.

4 A. Yes.

5 Q. Under the heading: Fact and  
6 Proceedings. I'm just referring you to the first  
7 paragraph which outlines the following:

8 "In 1976 and 1977, James Greenhill was  
9 seasonally employed by the United States  
10 Forest Service in Oregon. Although  
11 primarily a firefighter he occasionally  
12 participated in a weed control project  
13 called hack and squirt. This project  
14 required Greenhill to apply herbicides  
15 manufactured by Dow exposing him to..."

16 And I will just say:

17 "...2,4-D. Greenhill's exposure to 2,4-D  
18 ceased in 1978 when he was transferred to  
19 another park. A week later Greenhill was  
20 diagnosed with Hodgkin's Disease and he  
21 died seven years later."

22 Were you aware of those facts prior to  
23 this morning?

24 A. No, I was not but I find, just by way  
25 of observation without having gone through the

1 transcript of the trial, I find that paragraph among  
2 the most interesting I have ever seen with regards to  
3 cancer and any pesticide because this paragraph  
4 suggests that one year of exposure in that scenario  
5 gave rise to the disease.

6 I know of no form of cancer in which the  
7 latency period is one year. This paragraph suggests  
8 that one year following exposure to the purported  
9 carcinogen, cancer was diagnosed and directly linked to  
10 that exposure, and the only professional opinion, if  
11 you like, that I can offer just on that paragraph is  
12 that I know of no carcinogen which will produce cancer  
13 following the kind of exposure that might be  
14 anticipated here one year after the exposure has taken  
15 place.

16 Q. Can I just ask you to stop there for  
17 a moment. The paragraph begins:

18 "In 1976 and 1977..."

19 A. That's right.

20 Q. He was exposed for three years  
21 because his exposure ceased in 1978. His diagnosis was  
22 in 1979, that is four years; not one year.

23 MS. CRONK: (inaudible)

24 DR. RITTER: Well, I think in the  
25 interest of accuracy we could ascertain exactly when



1 was the first day that he was exposed and exactly the  
2 date on which he was diagnosed, but the comment that I  
3 just made to you would stand for two or three years as  
4 well.

5 I know of no carcinogen for which the  
6 latency period is that short following this kind of an  
7 exposure.

8 MR. MARTEL: What are the terms  
9 primarily, are they in the 20-year range?

10 DR. RITTER: Yes, for chemical exposure.  
11 For chemical exposure one tends to think of 25 years or  
12 so following exposure to be typical of latency periods.

13 In fact, that is often why we are  
14 concerned with epidemiology studies which do not show  
15 cancer when they are done too soon after the exposure  
16 has taken place; that is, there is also the risk that  
17 one is looking too early and that the absence of an  
18 adverse effect may be more a reflection of the time  
19 period rather than truity of the absence of a  
20 biological effect.

21 This paragraph - and I stand corrected,  
22 Mr. Castrilli - implies that a period of no more than a  
23 couple of years, that order, would have produced a  
24 cancer which was directly attributable to that  
25 exposure.

1                   And perhaps I shouldn't be venturing any  
2                   opinion without having read the transcript, but I'm  
3                   going to venture it anyway. I'm unaware of any other  
4                   situation where that has ever been documented.

5                   MR. CASTRILLI: Q. Page 2728, Dr.  
6                   Ritter. It's under the heading: Dr. Teitlebaum's  
7                   Testimony. In the second paragraph the court  
8                   summarizes the qualifications of Dr. Teitlebaum who was  
9                   the Plaintiff's principal witness and toxicologist.

10                  Outlines that he is a medical doctor  
11                  certified in toxicology, that he has had various  
12                  academic appointments in toxicology and poison control,  
13                  that he is consulted with several corporations on the  
14                  proper handling of poisonous materials and he served on  
15                  State and Federal Government Advisory Committees.

16                  He also published 89 or -- 88 or 89  
17                  articles on toxicology and had extensive experience in  
18                  evaluating lymphoma to determine whether there may or  
19                  may not have been an environmental or occupational  
20                  cause for the disease.

21                  Were you aware that a toxicologist had  
22                  reviewed -- of this status, had reviewed the slides in  
23                  relation to this matter?

24                  MS. MURPHY: He's not aware of anything  
25                  that happened at the trial or subsequently, how he can

1                   THE CHAIRMAN: So let's ask the direct  
2 question just for the record. Did you know that Dr.  
3 Teitlebaum or somebody who is a qualified toxicologist  
4 was the person giving the principal scientific evidence  
5 in connection with this case?

6                   DR. RITTER: No, I was not aware of that.

7                   MR. CASTRILLI: That's fine. Thank you.

8                   Q. And were you aware that he had  
9 reviewed the medical records in that case and had  
10 reviewed the medical literature on the subject and had  
11 examined the slides?

12                  THE CHAIRMAN: Mr. Castrilli, without  
13 wasting everybody's time I think his previous answer  
14 covers that kind of question.

15                  MR. CASTRILLI: All right.

16                  THE CHAIRMAN: If it is different, please  
17 advise us.

18                  DR. RITTER: Mr. Chairman, I have never  
19 heard of Dr. Teitlebaum or anything that he has ever  
20 done.

21                  MR. CASTRILLI: Q. Now, in the first  
22 full paragraph on the right-hand side of page 2728, Dr.  
23 Teitlebaum's evidence was that Mr. Greenhill's  
24 condition was most consistent with Hodgkin's Disease.

25                  Now, earlier today, Dr. Ritter, you and I

1 be aware of this is beyond me.

2 MR. CASTRILLI: Mr. Chairman, it's  
3 entirely relevant when we have one toxicologist sitting  
4 in Thunder Bay indicating that he knows of no  
5 carcinogen that can create this kind of -- or no  
6 exposure to a product that could create this kind of  
7 result within a several year period and, at the same  
8 time, one would need to know whether in fact another  
9 toxicologist who actually examined the relevant medical  
10 records came to a different conclusion.

11 I think it's important to know whether  
12 Dr. Ritter knew that a toxicologist in fact examined  
13 the medical records in relation to Mr. Greenhill.

14 THE CHAIRMAN: Well, as we understood his  
15 evidence, Mr. Castrilli, Dr. Ritter did not know  
16 anything about this case apart from this phone call  
17 from Mr. White.

18 I take it, Dr. Ritter, you have never  
19 seen the transcript, you have never reviewed the  
20 evidence?

21 DR. RITTER: I have never seen the  
22 transcript, I have never reviewed the evidence.

23 THE CHAIRMAN: And up until today, you  
24 didn't know the result?

25 DR. RITTER: That's correct.

1 had a discussion about what the epidemiology studies  
2 over the last several years have examined or attempted  
3 to examine when they set up the scientific parameters  
4 of their studies.

5 Do you recall advising me that one of the  
6 three diseases they were seeking to determine whether  
7 there was a relationship or not in relation to 2,4-D  
8 was Hodgkin's Disease?

9 DR. RITTER: A. That's correct.

10 Q. Dr. Ritter, can I ask you to turn to  
11 page -- sorry, 2732.

12 The herbicide that Mr. Greenhill was  
13 exposed to was Tordon 101, the brand name of a  
14 herbicide which includes 2,4-D as its ingredient.

15 Are you aware that Tordon 101 is one of  
16 the herbicides being proposed for use in Ontario's  
17 Crown forests?

18 A. Yes.

19 Q. The next page, 2733 - we are really  
20 looking at the top of the page - I'm going to ask you  
21 this question in relation to your experience with  
22 exposure studies.

23 The information set out there indicates  
24 that those who worked with Mr. Greenhill participated  
25 in hack and squirt operations and were exposed to



1 Tordon 101 and that they frequently got this on their  
2 clothing and skin.

3 They also indicated that they performed  
4 hack -- sorry, that the people who performed these  
5 operations applied the chemicals and were often exposed  
6 to fumes and that the herbicide had splashed upon  
7 themselves and others.

8 In your experience with the parameters of  
9 exposure studies with applicators in the field, is that  
10 a common occurrence?

11 A. It occurs.

12 Q. Thank you. Dr. Ritter, does a  
13 reported case such as this, if confirmed, cast any  
14 doubt in your view on the expert panel decision -- or  
15 excuse me, expert panel report in Exhibit 714?

16 THE CHAIRMAN: Mr. -- sorry.

17 Ms. Cronk?

18 MS. CRONK: Thank you, sir.

19 It is no longer premature for me to put  
20 my objection formally. I didn't rise before because I  
21 take no objection to questions Mr. Castrilli has put  
22 thus far.

23 What I would point out to you, sir, as no  
24 doubt you already observed, that the Court of Appeal  
25 Decision that has been put before you is an evidentiary

1 case --

2 THE CHAIRMAN: Sorry. We need you to speak  
3 up a little louder. Perhaps you would come to the  
4 microphone, Ms. Cronk.

5 MS. CRONK: I would just like to point  
6 out, Mr. Chairman, as no doubt the Board has already  
7 observed, that the Court of Appeal Decision that has  
8 been put before you is an evidentiary case.

9 The challenge brought from the District  
10 Court Decision to the Court of Appeal had to do with  
11 the admissibility of Dr. Teitlebaum's evidence, his  
12 opinion evidence on any number of grounds; there are  
13 seven or eight set out in the decision.

14 In my submission, as counsel for our  
15 clients, and as the other lawyers in the room will  
16 appreciate, there is material difference between an  
17 Appellate Decision which turns on an evidentiary point  
18 regarding opinion evidence and one which seeks to  
19 confirm, as a matter of soundness, the very decision  
20 from which appeal is taken.

21 My point is this: The test on appeal in  
22 this case was whether the Court of first instance had  
23 made a manifest error in admitting the testimony of the  
24 expert. It doesn't verify or confirm -- it doesn't  
25 deal with anything other than upholding the decision of

1 the admissibility of his evidence. So I rise so that  
2 that is clear on the record, sir.

3 There are, of course, different kinds of  
4 Appellate Decisions that might deal with different  
5 subject matters; this one deals with that very narrow  
6 point.

7 I understood Mr. Castrilli to be asking  
8 Dr. Ritter whether a reported case of this kind  
9 affected his opinion with respect to the MOE study. I  
10 think he should make it clear whether he's talking  
11 about the jury's decision or whether he's talking about  
12 the Court of Appeal Decision on the evidentiary point.

13 And, in any event, I think the witness  
14 should be provided an opportunity to consider the case  
15 in full before he's obliged to answer any questions of  
16 that kind, given that he has indicated he hadn't had a  
17 chance to read it.

18 I suppose I rise formally to record on  
19 the record what I view as the proper characterization  
20 of the Appellate Court Decision and, implicitly what  
21 I'm saying, its limited utility to you in those  
22 circumstances.

23 But, at the very least, the witness  
24 should be afforded an opportunity to read the case, if  
25 this question is going to be put, and there is a

1 distinction that should be drawn between the Appellate  
2 Court Decision and the jury's award...

3 THE CHAIRMAN: Well, for that matter,  
4 it's probably prudent for the Board to have an  
5 opportunity to read both those cases as well, or at  
6 least these two exhibits.

7 MR. CASTRILLI: Mr. Chairman, just so you  
8 understand my position with respect to this matter,  
9 these decisions were made available to Ms. Murphy on  
10 Tuesday night. I said: Give them to the witness. She  
11 refused to do so, apparently, and so I cannot speak for  
12 why she decided to do that.

13 THE CHAIRMAN: Well, she has indicated  
14 when she rose at the outset, Mr. Castrilli, that she  
15 felt that these were matters of law that you would be  
16 dealing with and that Dr. Ritter was not an appropriate  
17 witness to be dealing with those kinds of questions.

18 Obviously, she can't address her concerns  
19 in not providing it to the witness at the time you gave  
20 it to her until she has at least canvassed that aspect;  
21 i.e., the subject of her objection with the Board.

22 She has done that today, we have  
23 determined that for the reasons given that these should  
24 be admitted, under the circumstances to which I alluded  
25 earlier, and now we are faced with you wanting to ask



1 subsequent questions on these documents, but this  
2 witness has really not had an opportunity of reading  
3 the entire document.

4 MR. CASTRILLI: Mr. Chairman, I'm only  
5 indicating, and first of all let me say that when I  
6 said reported case, I didn't mean it in the legal  
7 sense, I meant it in the sense of the scientific  
8 findings and conclusions of Teitlebaum -- Dr.  
9 Teitlebaum which are summarized in the evidence itself,  
10 and that was the sense in which I meant reported case.

11 THE CHAIRMAN: Okay. Well, we have  
12 canvassed that with Dr. Ritter and he was not aware of  
13 this case prior to today, except in terms of his  
14 conversation with this Mr. White.

15 MR. CASTRILLI: No, I simply want to  
16 compare and contrast Dr. Teitlebaum's findings with an  
17 exhibit that is already part of the record which is  
18 Exhibit 714.

19 MS. CRONK: Well, sir, that's my point.  
20 See, the only thing you have in the Appellate Court  
21 Decision - and, in my submission, the Board should be  
22 given an opportunity to consider the Decision in full  
23 before you are asked to rule on this - the only thing  
24 you have in the Court of Appeal's Decision is the  
25 grounds of appeal relating to admissibility of the



1 doctor's evidence.

2 To make those grounds clear, there is  
3 passing reference to things that he said, but you don't  
4 have, in this Appellate Decision, a synopsis of what  
5 the opinion evidence was at that trial and you  
6 certainly don't have it in the endorsement of the  
7 damages quantum.

8 I didn't object because I thought Mr.  
9 Castrilli would be asking Dr. Ritter if he agreed or  
10 disagreed with the scientific opinion expressed in the  
11 case, he didn't do that and it is because it is not  
12 fully here. It's a difficulty that you have.

13 THE CHAIRMAN: Well, I observe the  
14 objections, Ms. Cronk, and I think in fairness the  
15 Board should have an opportunity to at least canvass  
16 the two exhibits before making any rulings on them.

17 MS. CRONK: Thank you, sir.

18 THE CHAIRMAN: So perhaps we will do that  
19 at the next break.

20 MR. CASTRILLI: Mr. Chairman, I can also  
21 advise you at this point in time, it seems unlikely I  
22 am going to finish today in light of the interruptions  
23 over the last several days, but I will do my best to  
24 get as far as I can by the end of today.

25 There also seemed to be a lot of matters

1       that have been reserved in my cross-examination, that  
2       will force me, undoubtedly, to continue tomorrow on  
3       some of these matters.

4               THE CHAIRMAN: All right. Do you have  
5       any idea, so that we can advise other parties who are  
6       due to follow you, in fairness to them?

7               MR. CASTRILLI: It is conceivable I could  
8       be several hours tomorrow, but I will have a better  
9       sense -- it is only 2:30 and I presume we are going to  
10      sit to at least 5:30 today.

11              THE CHAIRMAN: Well, yes, but we have  
12      instructed OFAH to be here tonight prepared to go on  
13      early tomorrow morning. If in fact we are not going to  
14      reach them, they may not, particularly in view of the  
15      expense of coming up here, come up here today.

16              So we would like to at least be able to  
17      advise them in time that they may not be on tomorrow at  
18      all. And because we were going to deal with OFAH  
19      tomorrow, hopefully in the one day, we advised one of  
20      the alternate parties that they would not be on, that  
21      is Ms. Kleer for I guess NAN.

22              MS. BLASTORAH: Mr. Chairman, were you  
23      intending to sit a full day tomorrow or a short day?

24              THE CHAIRMAN: We were intending to sit a  
25      full day tomorrow so that we would -- well, sorry,

1       until about three. The last plane out for Mr. Martel  
2       is at four. As long as he could reach that, the rest  
3       of us could take one of the later flights.

4               So your best indication at this point in  
5       time, Mr. Castrilli, is that you will be at least a few  
6       hours tomorrow?

7               MR. CASTRILLI: It depends on how far I  
8       am going to get with what I have left. Normally what I  
9       have left would certainly be capable of being finished  
10      today, but it certainly has not gone as rapidly as I  
11      would have expected and that's why I am simply letting  
12      you know now.

13              THE CHAIRMAN: Would sitting until 6:00  
14      or 6:30 tonight be of assistance?

15              MR. CASTRILLI: Conceivably, yes. And  
16      speaking for myself, I would like to finish today.

17              THE CHAIRMAN: Okay. Why don't we, as  
18      they say in the vernacular, go for it. Is now a good  
19      time for a short break?

20              MR. CASTRILLI: Sure. I am content with  
21      that.

22              THE CHAIRMAN: Then we will come back and  
23      push on with some resolution.

24              DR. RITTER: Mr. Chairman, I wonder if I  
25      might just ask, in order to assist me, I'm not sure

1       what I am to do with this now. There has been some  
2       discussion as to my view of Dr. Teitlebaum's opinion  
3       which --

4                   THE CHAIRMAN: Well, why don't we do it  
5       on this basis: Why don't you read the documents during  
6       the break.

7                   DR. RITTER: I've skimmed through them.  
8       I would be less than honest with you if I left you with  
9       the impression that these summary statements are going  
10      to be of any value to me at all.

11                   If I'm to offer an opinion on Dr.  
12      Teitlebaum's testimony, I would really need Dr.  
13      Teitlebaum's testimony and the evidence that he  
14      reviewed.

15                   THE CHAIRMAN: Okay, that's fair enough.  
16      But why don't you do this, Dr. Ritter: During the  
17      break read the document, during the break the Board  
18      will also read the document, then we can at least deal  
19      with Mr. Castrilli's questions concerning these  
20      documents.

21                   It may be that they are of no value  
22      whatsoever in terms of the answers that he wants to  
23      elicit based on your most recent comment, but let's  
24      deal with that right after the break.

25                   DR. RITTER: Yes, sir.

1 THE CHAIRMAN: Okay. We will adjourn for  
2 15 minutes.

3 ---Recess taken at 2:30 p.m.

4 ---On resuming at 2:50 p.m.

5 THE CHAIRMAN: Thank you. Be seated,  
6 please.

7 Dr. Ritter, we have a couple of questions  
8 arising out of our reading of these documents.  
9 Firstly, I take it from your previous answers that you  
10 have never heard of Dr. Teitlebaum previously?

11 DR. RITTER: That's correct.

12 THE CHAIRMAN: Given Dr. Teitlebaum's  
13 alleged background contained in the Court of Appeal  
14 abstract, if he was involved as a toxicologist in this  
15 area and; that is, the area dealing with any causative  
16 links between 2,4-D and cancer of any type, is it  
17 likely that you would have heard of him or have run  
18 into him in the past or read scientific literature  
19 published by him?

20 In other words, is the fraternity -- the  
21 scientific fraternity around the world dealing with  
22 this particular product, known amongst those involved,  
23 to the extent that the major players are identified and  
24 at least would be somebody, if you hadn't met or  
25 conversed with directly, would have heard of?



1 DR. RITTER: I would say that the  
2 scientific fraternity in the context in which you ask  
3 the question probably numbers no more than 25 or 30  
4 individuals globally.

5 THE CHAIRMAN: Globally?

6 DR. RITTER: Globally. So that if Mr.  
7 Teitlebaum had made frequent contributions to the  
8 literature in the subject, I would have expected to  
9 have at least been familiar with his work, if not with  
10 him personally.

11 THE CHAIRMAN: Okay. And one follow-up  
12 question: Is it, in your professional opinion, likely  
13 for a scientist to be able to review some slides and  
14 arrive at a conclusion as to the causative factor of  
15 death relating to a substance like 2,4-D and cancer?

16 In other words, we have heard a lot of  
17 scientific evidence in the past few hours and days in  
18 terms of all kinds of studies conducted, many of which  
19 last years, is it likely for a scientist to be able to  
20 examine some slides of human tissue and make that  
21 causative link, in your view?

22 DR. RITTER: No. If I can just take a  
23 moment to elaborate on that just very quickly. The  
24 diagnosis in this case was for Hodgkin's lymphoma, and  
25 I should note that's very different from non-Hodgkin's

1 lymphoma, just by way of comparison.

2                   The diagnosis in itself would almost  
3 never provide direct information on the likely causes  
4 of the disease unless the disease in question was  
5 almost uniquely associated with a particular cause;  
6 that is to say, as I indicated last week, certain forms  
7 of lung cancer are known to occur almost always with  
8 regards to smoking.

9                   Certain forms of lung cancer such as  
10 mesiothelioma that we discussed the other day, are  
11 known to occur on exposure to asbestos. Certain forms  
12 of liver cancer such as hepatic hemangiosarcoma are  
13 known to occur on exposure to vinyl chloride.

14                  So that when one makes the diagnosis of  
15 hepatic hemangiosarcoma it might be reasonable to  
16 inquire as to the likely exposure of the patient to  
17 vinyl chloride.

18                  Hodgkin's Disease is a relatively common  
19 disorder and it occurs with some frequency,  
20 particularly in individuals under about 40 years of  
21 age. I would think it would be difficult, if not  
22 impossible, given the rather general nature of the  
23 disease, to establish a possible cause from a  
24 histologic confirmation.

25                  THE CHAIRMAN: Okay. Well, Mr.

1       Castrilli, the Board's further review of these  
2       documents, in our opinion, confirms Ms. Cronk's  
3       submission that the Court of Appeal apparently dealt  
4       with this case on the basis of admissibility of  
5       evidence in the first instance and did not reach a  
6       finding on the scientific evidence.

7               The first decision was a jury verdict on  
8       the scientific evidence put forward by Dr. Teitlebaum  
9       and that specific evidence is not really before us at  
10      this time. ,

11              I'm not sure that the Board is all that  
12      interested in questions concerning liability for the  
13      use of a product in terms of that product allegedly  
14      causing the death due to the use of that product. We  
15      are more interested in the type of scientific studies  
16      on this question that we have been reviewing to date  
17      put in by yourself and this panel and earlier ones by  
18      Ms. Cronk.

19              I'm not sure that it would serve a very  
20      useful purpose to produce the evidence that Dr.  
21      Teitlebaum relied upon at the earlier trial.

22              I leave that to you, however, to deal  
23      with in terms of whether or not you are going to be  
24      making that request, and your questions today will have  
25      to be directed to Dr. Ritter on the basis that he has

1 not seen that evidence and he has already indicated  
2 that he may not be able to provide you with much  
3 assistance based on this Court of Appeal synopsis.

4 Sorry, Dr. Ritter has indicated already  
5 that he will probably not be able to assist you  
6 materially based on the Court of Appeal synopsis of  
7 that scientific evidence to the extent that it exists.

8 So I don't know where you want to go with  
9 these two documents. I leave that in your hands at the  
10 moment.

11 MR. CASTRILLI: Mr. Chairman, I didn't  
12 actually have that many more questions. I'm content in  
13 light of your comments to leave the matter where it is  
14 for now.

15 THE CHAIRMAN: Okay.

16 MR. CASTRILLI: One moment's indulgence,  
17 if I might.

18 Q. Dr. Ritter, your testimony on  
19 August -- I have it as August 8th, indicated that  
20 generally 80 per cent of pesticide exposure occurs  
21 through the hands for mixers and loaders?

22 DR. RITTER: A. That's correct.

23 Q. And that would be true for 2,4-D as  
24 well?

25 A. Yes.

1 Q. Would you agree that one -- would it  
2 be fair to say that one way to prevent or at least  
3 minimize exposure would be for workers handling 2,4-D  
4 to wear impermeable rubber gloves?

5 A. I would prefer to say gloves that are  
6 resistant to 2,4-D.

7 Q. Or chemically resistant gloves, would  
8 that be --

9 A. Sure, yes.

10 Q. In other words, they could be rubber,  
11 they could be something else?

12 A. Yes.

13 Q. Okay. Would it be fair to say, Dr.  
14 Ritter, that not all gloves are created equal?

15 A. Yes.

16 Q. Certain glove types are more  
17 effective in preventing exposure to a chemical such as  
18 2,4-D than others?

19 A. Actually the principal mitigating  
20 factor, Mr. Castrilli, is not the active ingredient at  
21 all but rather the formulation components, the presence  
22 of some solvents as compared to others.

23 In our experience - and we've just  
24 recently published a report on that very subject - it  
25 was the formulation components that played a larger



1 role in affording protection -- rather, in determining  
2 the nature of the glove material required than the  
3 active ingredient itself.

4 Q. But what you are trying to do when  
5 you wear a glove or gloves is prevent exposure from  
6 both the active ingredient and the inert--

7 A. That's right.

8 Q. --if I can use that term?

9 A. That's correct.

10 Q. The more chemically resistant the  
11 material, the better for purposes of minimizing  
12 exposure?

13 A. Generally speaking, yes.

14 Q. And for the purposes of this  
15 discussion, the more impermeable the better?

16 A. Yes.

17 Q. Is that right?

18 A. Yes.

19 Q. Are you familiar with a 1988  
20 survey -- I should say, a survey published in 1988  
21 conducted for the Ministry of Environment respecting  
22 2,4-D use and exposure--

23 A. Yes.

24 Q. --in Ontario.

25 A. I believe I am.

1 Q. It is entitled -- the report itself  
2 is entitled: A Profile of 2,4-D Use and Exposure in  
3 Ontario presented to the Ministry of Environment--

4 A. Yes.

5 Q. --on behalf of a consulting firm in  
6 Guelph?

7 A. Yes.

8 MR. CASTRILLI: Mr. Chairman, I have, as  
9 you might imagine, excerpts from this report as opposed  
10 to the entire document.

11 The excerpts I have are in relation to  
12 that portion of the report that deals with forestry  
13 use. The entire report actually deals with 2,4-D in  
14 other contexts besides forestry, but due to its length  
15 I have only included the portion dealing with forestry.

16 THE CHAIRMAN: Has the witness had a look  
17 at the full document?

18 MR. CASTRILLI: I haven't provided him  
19 the full document, I have provided him the chapter on  
20 forestry and 2,4-D.

21 THE CHAIRMAN: You are aware, Dr. Ritter,  
22 of the document generally though?

23 DR. RITTER: Yes, I am.

24 THE CHAIRMAN: Okay. Do you want to  
25 distribute it?

1 MR. CASTRILLI: Yes. That exhibit would  
2 be...?

3 THE CHAIRMAN: Exhibit 761.

4 MR. CASTRILLI: Dr. Ritter, you already  
5 have a copy of the excerpt?

6 DR. RITTER: Yes, I do.

7 MR. CASTRILLI: (handed)

8 THE CHAIRMAN: Thank you.

9 ---EXHIBIT NO. 761: Excerpt from a report entitled: A  
10 Profile of 2,4-D Use and Exposure  
11 in Ontario presented to the  
Ministry of Environment.

12 MR. CASTRILLI: Q. Sorry, Dr. Ritter,  
13 let's begin with page 31 which is actually Table 4.6?

14 DR. RITTER: A. Yes.

15 Q. The heading of the table is: Use of  
16 Protective Clothing by MNR Employees in 1986. This is  
17 in relation to forestry.

18 The total number of workers identified  
19 for the purposes of this survey were 99 and, Dr.  
20 Ritter, in the middle of the -- excuse me, in the  
21 middle of the table are two headings Rubber Gloves and  
22 Neoprene Gloves.

23 I can tell you -- well, you can accept  
24 this subject to verification, there appears to be no  
25 description or definition of the nature of the rubber

1 gloves, so we can't really talk about it.

2 Just focusing on the neoprene gloves, are  
3 you aware of the use of neoprene gloves in the area of  
4 herbicide use?

5 A. Generally, yes.

6 Q. Is it fair to say that -- would they  
7 be better or worse than general rubber gloves in terms  
8 of being chemically resistant, if you know, in relation  
9 to the exposure studies you have been involved with?

10 A. They may be neither or both. It's  
11 very formulation dependent. They can be as good as  
12 rubber, they can be better or they can be worse.

13 Q. Well, whether it's rubber gloves or  
14 neoprene gloves, some gloves are better than no gloves  
15 at all?

16 A. That's correct. As I indicated, Mr.  
17 Castrilli, we have a publication which is in press at  
18 present time where we have examined the efficacy of a  
19 matrix of five glove materials against a combination, I  
20 believe, of four pesticide formulations in trying to  
21 determine which glove material was most effective in  
22 retarding penetration by which formulation type, and  
23 that paper is currently in press.

24 Q. Is that something you might be able  
25 to make available to the Board at the first

1 opportunity?

2 A. At the first opportunity. I would  
3 add that at this time, generally speaking, as you may  
4 know, it's the editorial policy of most journals that  
5 manuscripts in press should not be released until they  
6 appear in the journal.

7 So unless there is some compelling reason  
8 why you would like that at this time, I would prefer to  
9 allow it to appear before I make it available.

10 Q. I just want a sense of what your  
11 understanding of the time frame is?

12 A. A few months.

13 Q. A few months. Dr. Ritter, as you  
14 might imagine, we are undoubtedly going to be here, so  
15 I think we can probably wait.

16 In any event, Dr. Ritter, would you  
17 confirm for me that less than 99 of the MNR employees  
18 wore either rubber gloves or neoprene gloves?

19 A. Well, to be precise 81 of 99 wore one  
20 or the other.

21 Q. That's right.

22 A. Yes.

23 Q. Less than 99?

24 A. Yes.

25 Q. And we do not know from this study



1 the nature of the rubber gloves worn and we do not know  
2 anything about the neoprene gloves in relation to 2,4-D  
3 use; do we, in terms of their chemical resistance?

4 A. Let me say that either one would  
5 serve to retard uptake of 2,4-D. What may be different  
6 is the extent to which one or the other may be useful  
7 in that capacity, but both would go a long way to  
8 retard uptake to some significant degree to 2,4-D  
9 during typical handling.

10 I should say that 81 of 99 is reasonably  
11 good compliance, in fact, very good compliance. I  
12 think it would be better if 99 of 99 had worn gloves,  
13 but 81 of 99 is impressive.

14 Q. Okay. Now, do you say that -- your  
15 last comment, that wearing either rubber gloves or  
16 neoprene gloves would significantly, you said, retard  
17 the uptake of 2,4-D?

18 A. That's correct.

19 Q. Do you say that on the basis of a  
20 study done in relation to 2,4-D with respect to gloves?

21 A. One of the components that we have  
22 actually tested in this study to which I was referring  
23 a moment ago is 2,4-D formulation.

24 Q. Oh, all right.

25 A. But I say that both in that regard

1 and in the general context, in that it's unlikely that  
2 the use of a relatively impermeable material, be it  
3 rubber or neoprene, would do anything except to serve  
4 to retard the uptake. It's difficult to envision how  
5 the use of an impermeable material would actually  
6 enhance uptake. So in the...

7 Q. But my question is really, Dr.

8 Ritter: Do we know whether the category, rubber  
9 gloves, is impermeable or chemical resistant at all if  
10 we don't know anything about the gloves?

11 A. No, that's not correct. We do know  
12 that rubber gloves do provide a measure of retardation  
13 in terms of chemical uptake. That's been well  
14 established in the literature for some time.

15 What our study endeavoured to do was to  
16 define very specifically with regards to gloves that  
17 are commercially available and formulation types which  
18 are popular which was best for what. And in the  
19 general sense one can say, absolutely that it's  
20 well-known that both neoprene and rubber will serve to  
21 retard uptake of chemicals through the skin.

22 Q. Dr. Ritter, do you recall the  
23 testimony of the Alachlor hearing?

24 A. Yes.

25 Q. And the rubber glove study that was

1       dealt with there?

2                   A.   Yes.

3                   Q.   And do you recall that eight glove  
4       types were studied there?

5                   A.   Yes.

6                   Q.   And do you recall how many of those  
7       glove types were effective in retarding chemical uptake  
8       of alachlor?

9                   A.   I believe that they were all  
10       effective to some degree.  Were they not?  You may have  
11       a better recollection about the events than I do.

12                  Q.   Well, you are the only one as between  
13       the two of us who can give the evidence, so...

14                  A.   As I recall, all gloves were  
15       effective in retarding uptake.

16                  If you recall, Mr. Castrilli, in the  
17       Alachlor case in particular the difficulty really  
18       turned on the precise level of protection that the  
19       glove afforded because there was an objective target  
20       level which was to be achieved and there was some  
21       debate in those proceedings as to whether or not the  
22       use of gloves would provide that precise level of  
23       protection which was considered necessary.

24                  That's essentially a very different set  
25       of circumstances than what we are talking about here.

1 Firstly, we know that 2,4-D is not taken up very  
2 readily, and we know that from a number of exposure  
3 studies that have been done specifically with 2,4-D in  
4 forestry workers.

5 Q. I'm sorry. Just stop. I don't mean  
6 to interrupt you, I just wanted to stop you there.  
7 2,4-D is not taken up very readily?

8 A. Through the skin.

9 Q. Through the skin, but I thought your  
10 testimony was that 80 to 90 per cent of exposure occurs  
11 through the hands?

12 A. Those are not inconsistent  
13 statements, Mr. Castrilli. What the two say is, that  
14 of the chemical that is available for uptake, the  
15 majority would be taken up through the hands, but that  
16 is not to say that there is a large amount taken up  
17 through the hands.

18 In other words, if one per cent of the  
19 exposed dose is available for uptake, then as much as  
20 80 per cent of that one per cent might be taken up  
21 through the hands. But if there is very little taken  
22 up in the first place, 80 per cent of a small number is  
23 still a very small number.

24 A. What I'm suggesting to you is that  
25 there are human exposure trials with 2,4-D and, in

1 particular, in the forestry applications of 2,4-D, one  
2 of which was conducted here in Ontario, and these  
3 trials suggest that uptake of 2,4-D through human skin  
4 is somewhat limited.

5 Q. And you say that is consistent with  
6 80 to 90 per cent of it being -- of exposure occurring  
7 through the hands?

8 A. It's got nothing to do with it.  
9 Those are separate principles. The majority of  
10 exposure during the normal workday in handling  
11 pesticides takes place typically during the mixing and  
12 loading phase. Consequently, the hands most typically  
13 are that part of the body which are exposed to the  
14 greatest amount.

15 That is not to say that a chemical is or  
16 is not absorbed to any extent, that simply says that  
17 the hands provide the greatest anatomic opportunity for  
18 absorption to take place and does not speak to the  
19 actual level of absorption which may take place with  
20 any given chemical.

21 In the case of 2,4-D, what I'm telling  
22 you is that with conventional use practises it might be  
23 reasonable to expect that the numbers I have given you  
24 with regards to hand exposure might also be typical for  
25 many 2,4-D applications but, in addition to that, I'm



1       telling you that uptake of 2,4-D through human skin is  
2       not very good, it tends not to be taken up very well.

3               A relatively small proportion of the  
4       available dose is actually absorbed, and that has been  
5       documented in at least two reports which perhaps I can  
6       give you the reference to.

7               The one done in Ontario was published in  
8       1985 by Richard Frank and others and it's entitled:  
9       Forestry Workers Involved in Aerial Application of  
10      2,4-dichlorophenoxyacetic acid (2,4-D) Exposure and  
11      Urinary Excretion, published in Archives of  
12      Environmental Contamination and Toxicology, Volume 14,  
13      page 427, 1985.

14              And a second report published by Terry  
15      Lavie and others entitled: 2,4-dichlorophenoxyacetic  
16      Acid Exposure Received by Aerial Application Crews  
17      During Forest Spray Operations, and that was published  
18      in the Journal of Agricultural Food Chemistry, Volume  
19      30, page 375, 1982.

20              To just elaborate briefly, Mr. Castrilli,  
21      on these studies, these studies involved analysis of  
22      urinary levels of 2,4-D which, in our view, is the most  
23      sensitive and reliable method by which to estimate in  
24      the truest sense of the word exposure to a chemical.  
25      That is, we are less concerned with how much lands on

1 the skin, we are more concerned with how much gets in.

2 And because both of these studies were  
3 directed at actual body burdens of the chemical, they  
4 both achieved that degree of precision which one often  
5 doesn't see in exposure studies. Both of these studies  
6 provide essentially similar results.

7 Noting that the Ontario study suggests  
8 actually lower levels of exposure than Lavie reported  
9 in the United States. But both studies report, what I  
10 would consider to be, relatively limited levels of  
11 exposure following these typical applications.

12 Q. Just let me ask you to turn to Table  
13 4.8 -- sorry, that will be page 33.

14 A. Yes.

15 Q. The use of either rubber gloves or  
16 neoprene gloves for -- or excuse me, by custom  
17 application employees in 1986 is; would you agree, just  
18 slightly over 50 per cent, 26 of 59?

19 A. Yes.

20 Q. Are those still regarded as good  
21 numbers in your view?

22 A. They are still good numbers, yes. We  
23 would generally consider compliance with these sorts of  
24 directives anywhere around 50 per cent or better to be  
25 impressive for lack of a better word. It's far better

1       than it was some years ago.

2                   Q.   For those who are wearing the gloves?

3                   A.   Well, I'm talking about the situation  
4       is far better; that is, compliance generally speaking  
5       was far less impressive.

6                   Mr. Castrilli, there is perhaps an  
7       interesting twist to that data that you have presented  
8       that may be of interest to note.

9                   The totals on the bottom of Table 4.8 are  
10      just that, they are totals but in the aerial  
11      application crews this consists both of pilots and of  
12      actual crew that would be involved in the application.

13                  Now, if you look at the number of crew  
14      that wore protective gloves, I think you will find that  
15      it approaches one hundred per cent and you might want  
16      to ask yourself: What would be the value of a pilot  
17      wearing protective gloves. So in fact, compliance is  
18      about 100 per cent for those people we might actually  
19      expect to be exposed and is virtually non-existent for  
20      those people who would not be exposed at all.

21                  THE CHAIRMAN: I can assure you if you  
22      are wearing other than rubber gloves in a cockpit you  
23      would likely be pushing the wrong button or the wrong  
24      switch. It would be entirely impractical really to  
25      wear heavy gloves of type that would be considered work

1 gloves and still operate an aircraft, I would suggest.

2 DR. RITTER: In the context of public  
3 health, Mr. Chairman, it would also not be indicated.  
4 The pilot of the aircraft would not be expected to be  
5 at risk to the exposure to the chemical.

6 But I just note, Mr. Castrilli, that of  
7 the crew compliance is extremely impressive.

8 MR. CASTRILLI: Q. Table 4.3, Dr.  
9 Ritter, page 26 -- excuse me, page 25.

10 DR. RITTER: A. Yes.

11 Q. The number of days -- sorry, number  
12 of -- this is employee statistics for the Ministry of  
13 Natural Resources, cites the number of workers  
14 involved, the average age, the district jobs involved,  
15 average number of days applying. Just looking at Table  
16 4 .3 at page 26.

17 A. Yes. Page 25.

18 Q. I am sorry, page 25 and also page 26  
19 is the same table continued on the next page.

20 A. Yes.

21 Q. Would you agree that some mixers and  
22 loaders spent, on average, 20 or more days a year in  
23 connection with the application of 2,4-D? I refer you,  
24 for example, to the Hearst District and the Fort  
25 Frances District?

1           A. There is only really two examples of  
2 what you are referring to. There are I think about 21  
3 entries on these two pages. There are only two in  
4 which the mixing and loading operation took place for  
5 more than 20 days.

6           In fact in reviewing the table on those  
7 two pages, Mr. Castrilli, the majority were of the  
8 order of one, two, three, four days and the small  
9 minority were of the order that you have indicated.

10          Q. Are these unimportant?

11          A. They are not unimportant, I am merely  
12 making a statement of fact. I simply wanted to make it  
13 clear that the number of people who are involved in  
14 that occupation for more than 20 days were by far and  
15 away in the minority and the majority of employees in  
16 that capacity worked typically for periods of 4, 3.5,  
17 2, 5. we could actually work out the averages, if you  
18 like.

19          Q. Let's not talk about the averages.  
20 It's clear; is it not, Dr. Ritter, that some personnel  
21 of MNR in Table 4.3 were exposed to 2,4-D through their  
22 jobs for more than 20 days per year?

23          A. Yes.

24          Q. And similarly in Table 4.4 which is  
25 the table on FMA company employee statistics?



1 A. Yes.

2 Q. For which statistics are available  
3 that in Spruce Falls some mixers and loaders who would  
4 have been exposed to 2,4-D for more than 20 days per  
5 year on average?

6 A. Yes.

7 Q. Your answer is yes?

8 A. Yes.

9 Q. And similarly in Table 4.5, Dr.  
10 Ritter--

11 A. Yes.

12 Q. --there were mixers and/or loaders  
13 who would have spent, on average, greater than 20 days  
14 per year spraying 2,4-D -- not spraying 2,4-D, mixing  
15 or loading 2,4-D?

16 A. Well, the table as it's presented,  
17 Mr. Castrilli, 4.5 really mixes in pilots, loaders  
18 mixers. I certainly can't determine from the  
19 information here how many in there were actually  
20 involved in the mixing operation and the loading  
21 operation and how many -- what contribution -- what is  
22 the distribution of those numbers; that is what I'm  
23 trying to say. It's a cumulative table.

24 I'm unable really to confirm for you what  
25 you are asking me to confirm. That information simply

1       isn't in that table.

2                   Q.   When I look at Hicks and Lawrence and  
3   I see a heading called:  Loaders and I see a number 40  
4   under average number of days applying, you are saying  
5   you do not conclude that it was loaders who spent up to  
6   40 days applying 2,4-D for the period outlined?

7                   A.   Yes, in that case, I think you are  
8   correct.  Two loaders spent, on average, up to 40 days  
9   applying.

10                  MS. MURPHY:  I must have missed  
11   something.  I was confused.  I thought he was asking  
12   about the FMA companies.  Were you in fact asking about  
13   the custom applicators?

14                  MR. CASTRILLI:  We already talked  
15   about -- we are one table ahead of you, Ms. Murphy.  We  
16   are on Table 4.5, which is custom applicators.

17                  MS. MURPHY:  That doesn't surprise me at  
18   all.

19                  MR. CASTRILLI:  Q.  Table 4 .5.  Sorry,  
20   Dr. Ritter your answer is that for loaders at least for  
21   Hicks and Lawrence it's apparent that they would have  
22   been exposed to 2,4-D during the course of their job on  
23   average up to 40 days?

24                  DR. RITTER:  A.  Yes.

25                  Q.  Per year?

1 A. Yes.

2 Q. Thank you.

3 A. Mr. Castrilli, there may be a point  
4 of clarification here that may be in order, I'm not  
5 sure if it is or it isn't.

6 I'm sure you are aware that these  
7 statistics I think relate to overall occupational  
8 exposure. Now, you raised this document in the context  
9 of forestry application and it appears at least from  
10 Table 4.5 that these exposures are not restricted to  
11 forestry application.

12 I draw that to your attention because in  
13 the context of forestry application, which is the  
14 subject matter of this hearing, the exposure may have  
15 been much less frequent than 40 days on average per  
16 year and that this table really doesn't provide any  
17 information on what the distribution from these various  
18 occupational exposures would have been.

19 I would expect that, given the nature of  
20 agricultural practice, I think it would be reasonable  
21 to expect that four people doing this commercially for  
22 a living, that there would be significant exposure in  
23 terms of a daily opportunity from the agricultural  
24 setting simply because it's a much larger environment.

25 Q. Sorry, you say that in relation to

1 Table 4.5?

2 A. Well, I say that really in relation  
3 to the way in which the data is presented. Unless it's  
4 clear that the number of days assigned here are  
5 specific to the task which you and I are discussing, I  
6 can't confirm for you that it is specific to the  
7 forestry task.

8 Q. Sorry, you were saying that in  
9 relation to Table 4.5?

10 A. Well, I might say it in relation to  
11 4.4, I might say it in relation really to any table  
12 which is in this summary document because the  
13 distribution of those occupational activities is not  
14 clear from the way the data is presented.

15 Q. Dr. Ritter, this is a chapter on  
16 forestry use and the headings for Tables 4.4 and 4.3  
17 are in relation to respectively, FMA company employees  
18 and OMNR employees. Do you have of any OMNR employees  
19 who farm in their capacity with MNR?

20 A. No, but I think it would be important  
21 to establish whether or not MNR employees carry out any  
22 spraying other than for forestry in their capacity as  
23 employees of MNR.

24 I'm simply suggesting to you, Mr.  
25 Castrilli, that from the information here that's not

1 clear, and further I'm suggesting to you that from  
2 Table 4.5 it is clear that it includes exposure from  
3 other occupational settings.

4 I would draw your attention to the  
5 footnote at the bottom of the page. So there is  
6 absolutely no question that it involves exposure from  
7 other occupational scenarios in Table 4.5, and I simply  
8 leave you with the thought that it is less clear from  
9 the other tables.

10 Q. Notwithstanding it's a chapter on  
11 forestry use?

12 A. Mr. Castrilli, Table 4.5 is from a  
13 chapter on forestry and it's evident that Table 4.5  
14 refers to exposures from settings other than forestry.  
15 I'm not trying to draw any inference, I'm simply trying  
16 to draw your attention to what's I think obvious.

17 Q. That footnote at the bottom of 4.5  
18 does not appear in the other tables; does it?

19 A. That's correct.

20 Q. So your assumption is based on  
21 extrapolating what appears in 4.5 to what appears in  
22 the other tables?

23 A. No, I haven't made any assumptions,  
24 Mr. Castrilli.

25 THE CHAIRMAN: Well, hold on. Hold on.



1       Gentlemen, I think probably you have exhausted whatever  
2       inference may or may not be drawn from the footnote on  
3       4 .5. I think we are just wasting time to go on any  
4       further.

5       .               MS. MURPHY: Mr. Chairman, I can advise  
6       that with respect to the MNR employee their activities  
7       are related to forestry, I can tell you that. I think  
8       it's also abundantly clear from what the witness is  
9       saying, is that that is not true of the custom  
10      applicators.

11                    THE CHAIRMAN: Okay. And I think that  
12      has been brought out in the interchange.

13                    MR. CASTRILLI: Q. Mr. Kingsbury, I  
14      refer you to exhibit --

15                    THE CHAIRMAN: Let Mr. Kingsbury wake up.

16                    MR. CASTRILLI: Q. I didn't mean to  
17      leave you out of this, Mr. Kingsbury. Do you have your  
18      ESSA Document in hand?

19                    MR. KINGSBURY: A. Yes, I have it close  
20      by.

21                    Q. Page 23.

22                    A. I'm there.

23                    Q. The report in the first full  
24      paragraph on the page indicates that:

25                    "In general 2,4-D is not susceptible to

1 significant leaching and this is  
2 particularly true for the ester  
3 formulation."

4 Do you see that?

5 A. Yes, I see that.

6 Q. Is that a view that you share?

7 A. I would concur with that.

8 Q. Are you aware that the U.S. EPA has  
9 concluded that 2,4-D is mobile to highly mobile in  
10 sand, silt, loam, clay and sandy loam soils?

11 A. I'm aware that in an overall review  
12 of 2,4-D mobility including all use patterns, that they  
13 may have stated that conclusion.

14 MR. CASTRILLI: Mr. Chairman, I'm  
15 referring to Exhibit 748, the 2,4-D registration  
16 document.

17 Q. Page 17, the fourth paragraph, Mr.  
18 Kingsbury.

19 A. Yes, I have it.

20 Q. "Under aerobic conditions 2,4-D  
21 degrades rapidly in most soils and is  
22 mobile to highly mobile in sand, silt,  
23 loam, clay loam and sandy loam soils."  
24 And the report goes on to note that:  
25 "The 2,4-D degradates of ester and amine

1 forms of 2,4-D can also be expected to be  
2 mobile."

3 Do you agree with that assessment?

4 A. Yes. I would also include that the  
5 two sections that you passed over there, that suggest  
6 that in an aged residue study 2,4-D was only slightly  
7 mobile and the compound has an affinity to bind to  
8 organic matter over time. Those are both important  
9 factors concerning its actual ability to leach in  
10 forest soils.

11 Q. Well, if you note, Mr. Kingsbury, can  
12 you tell me: Do we have sand, silt, loam, clay loam  
13 and sandy loam soils in the boreal forests of Ontario?

14 A. As you might appreciate, Mr.  
15 Castrilli, those are general categories. There are a  
16 great number of different types of soils within each of  
17 those categories.

18 Yes, we do have them, as an answer to  
19 your general question. I think that, however, if I can  
20 refer you to page 11 where the agency summarizes the  
21 data that has been reviewed, they conclude that:

22 "Although laboratory data demonstrate  
23 that 2,4-D is mobile in soils..."

24 And I would suggest that some, if not  
25 all, of the conclusions you have drawn about 2,4-D's

1 mobile to highly mobile character is in fact generated  
2 from laboratory data. On page 11 under point 5 it goes  
3 on to say that:

4 "Its potential to contaminate groundwater  
5 is limited by its rapid rate of  
6 degradation and its uptake by target  
7 plants."

8 And I believe that you will find this  
9 entirely consistent with what is presented on page 23  
10 of the ESSA Document.

11 Q. So your view is, page 23 is  
12 consistent with the view that EPA has stated with  
13 respect to mobility; is that right?

14 A. And that in fact it is particularly  
15 appropriate with respect to the fate of 2,4-D applied  
16 to forestry sites in Ontario. One must understand  
17 that...

18 Q. The Smith and Hayden reference, 1976  
19 in that paragraph.

20 A. Referring now to the ESSA Document?

21 Q. Yes, that's right. Smith and Hayden,  
22 were they investigating soils in Ontario?

23 A. If you give me a moment to refer to  
24 that.

25 Q. It's page 136.

1                   A. They are dealing with field studies  
2 with herbicides commonly used in Saskatchewan.

3                   Q. It's relevant to Ontario?

4                   A. It's relevant to field situations.  
5 As I suggested, much of the data concerning the  
6 tendency of 2,4-D to move, as is alluded to on page 11  
7 in that summary statement, says:

8                   "Although laboratory data demonstrate  
9 that 2,4-D is mobile in soils..."

10                  I'm suggesting that in field situations,  
11 because of the two additional conditions that are  
12 mentioned in that summary statement; namely, rapid  
13 degradation, secondly uptake by target plants which  
14 are, of course, not part of a laboratory test, that in  
15 fact in field situations the leaching potential of  
16 2,4-D is not nearly what laboratory situations suggest  
17 it might be.

18                  Q. Well maybe, Mr. Kingsbury, just to  
19 shorten this up - and you don't need to tell me now -  
20 if you can just advise the Board when you have the  
21 information which of the references on page 23 that  
22 draw that conclusion are applicable or were done in  
23 Ontario?

24                  A. In field situations?

25                  Q. Yes. As I say, you don't need to do



1       it now if you don't know, you can just advise us when  
2       you have that information.

3                   A. Well, I would further suggest that  
4       really what we need to do to determine this is to  
5       determine what, of the data that EPA uses to draw the  
6       conclusion that 2,4-D can be highly mobile in certain  
7       soil types, is in fact laboratory data done in the  
8       absence of target plant material, which it says are  
9       important in terms of taking up and preventing the  
10      material from moving.

11                   And in the absence of field degradation  
12      conditions which are also important in that they  
13      obviously reduce the movement of the material if in  
14      fact it's degrading rapidly, so...

15                   Q. Let me just ask you, Mr. Kingsbury:  
16      why not simply have included the summary view of the  
17      U.S. EPA with respect to a clearly different position  
18      and simply have it on the record in one place? Why did  
19      you exclude any reference to the U.S. EPA document?

20                   A. Mr. Castrilli, I did not exclude any  
21      reference and I don't think that the authors of the  
22      ESSA Document would pretend, as we discussed yesterday,  
23      to even attempt to cover all of the available data that  
24      could be referenced in this document.

25                   THE CHAIRMAN: Mr. Castrilli, I think we

1 all appreciate that the presentation of documentation  
2 in forms of studies are subjective to the formulators  
3 of the study.

4 It is impossible, or virtually  
5 impossible, and I think the Board can take judicial  
6 notice of the fact, that it would be impossible to  
7 include all data sources world-wide for every issue  
8 that might arise in the course of a scientific study.  
9 And, therefore, there has to be some subjective  
10 judgment on the part of those putting forth the study  
11 as to what or what not should be included.

12 And I think the omission of a particular  
13 study, unless of course it is a study that is central  
14 and germane to the issue under discussion, doesn't  
15 necessarily impune the study.

16 MRS. KOVEN: I would agree with that, but  
17 I would add that, given the close connection between  
18 the research effort in the United States and Canada,  
19 some of the work of the EPA would be a logical starting  
20 point for an exercise like the ESSA?

21 MR. KINGSBURY: Not only -- yes, but --  
22 well, I would say that some of that work is in fact a  
23 logical starting point for registration -- federal  
24 registration evaluations and that, in fact, that that  
25 type of data just as it appears in and is reviewed by

1 EPA appears in and is reviewed by the Canadian agencies  
2 responsible for review.

3 It is not, however, necessarily complete  
4 data in that -- and as I tried to spell out, our  
5 process recognizes that one of the things we have to do  
6 before we register a material for forestry use in  
7 Canada is apply it under those conditions and see,  
8 regardless of what happens in the laboratory situation.

9 That may certainly have a great deal to  
10 do with the protocol development, the lab studies may  
11 certainly suggest that there are areas that need to be  
12 looked at more closely than other areas, that there are  
13 some use patterns which may present more of a problem.

14 As a for instance, in this case you might  
15 say, and we do say, it appears that we should have a  
16 study on the potential of a material to move in sand  
17 soils recognizing that in some forestry situations it  
18 may be applied to clay soils and behave quite  
19 differently and this is, in fact, part of the  
20 environmental fate guidelines.

21 It could be argued that if you are only  
22 registering it for use in a certain forestry situation  
23 that there would not be a need for that kind of data if  
24 it basically mitigates against it being used on very  
25 sandy sites.

1 MR. CASTRILLI: Q. Page 17 of Exhibit  
2 748.

3 MR. KINGSBURY: A. Yes.

4 Q. The first paragraph, the agency  
5 summarizes -- this is the issue of environmental fate  
6 still:

7 "Available data are insufficient to fully  
8 assess the environmental fate of 2,4-D.  
9 An ester or amine derivative of 2,4-D  
10 may behave differently in the  
11 environment. Only after the ester or  
12 amine derivative of 2,4-D acid degrades  
13 into the acid moiety is general data on  
14 2,4-D applicable. The Agency needs  
15 environmental fate data on each ester and  
16 amine as well as the acid itself."

17 And then in paragraph 3:

18 "The only acceptable data available to  
19 the Agency is for the parent 2,4-D."

20 Just stopping there, Mr. Kingsbury, is  
21 that a situation that also exists in Canada?

22 A. With respect to the data available or  
23 with respect to the conclusions drawn here?

24 Q. Well, let's just take the first  
25 paragraph first.

1 A. That's a conclusion drawn by the EPA.

2 Q. In relation to the United States and,  
3 I'm asking you--

4 A. Yes.

5 Q. --if you know, is that a conclusion  
6 that applies to Canada as well?

7 A. I don't -- I would suggest that it is  
8 not a conclusion that Canadian regulatory authorities  
9 have made, in that I'm not aware that they have in fact  
10 requested studies be done regarding the fate of the  
11 ester or amine derivative of 2,4-D.

12 THE CHAIRMAN: Is that for the same  
13 reason explained by Dr. Ritter earlier in terms of  
14 bio-equivalency?

15 MR. KINGSBURY: That's correct, Mr.  
16 Chairman.

17 MR. CASTRILLI: Q. The U.S. EPA regards  
18 that as a major data gap in the United States. Is it  
19 your position that it is not to be regarded as a major  
20 data gap in Canada?

21 MR. KINGSBURY: A. I would suggest that  
22 that's Agriculture Canada's position, although I can't  
23 speak directly for them.

24 Q. What about you in your capacity--

25 A. I would --



1 Q. --as spokesperson for the ESSA  
2 exercise?

3 A. Mr. Castrilli, I want to be precise.  
4 As spokesperson for the ESSA exercise, as you've  
5 described me, I wouldn't be making conclusions about  
6 data gaps I don't believe in the registration data  
7 available; I would be summarizing, for the purposes of  
8 this hearing, environmental fate data that is  
9 available.

10 Q. Just returning to what is exhibit --

11 A. I believe that -- if I can just go  
12 back to that. I would say that what the ESSA Document  
13 has said is contained in the first paragraph on page 22  
14 under 2,4-D. It says -- it discusses the different  
15 formulations. It says:

16 "In any case, 2,4-D esters hydrolyze to  
17 less volatile acid or salt forms in time  
18 periods varying from a few hours to a few  
19 days after application."

20 And working from that basis, is basically  
21 saying that if we study the fate of the acid we  
22 basically are encompassing the environmental fate of  
23 2,4-D formulations applied to Ontario forests.

24 Q. Mr. Kingsbury, continuing with you, I  
25 understand that your testimony is that fenitrothion --

1 for the record, I haven't used this word yet during  
2 these last three days. It is spelled  
3 f-e-n-i-t-r-o-t-h-i-o-n.

4 MR. CASTRILLI: So if you hear me say  
5 anything like that--

6 MR. KINGSBURY: Fenitrothion?

7 MR. CASTRILLI: Yes, you should type that  
8 word.

9 THE CHAIRMAN: I guess I missed getting  
10 that down, Mr. Castrilli.

11 MR. CASTRILLI: It's  
12 f-e-n-i-t-r-o-t-h-i-o-n. Excuse me, I have now spelled  
13 it wrong, quite apart from not being able to pronounce  
14 it. The last five letters are t-h-i-o-n.

15 THE CHAIRMAN: Okay.

16 MR. MARTEL: What are the first ten?

17 MR. CASTRILLI: Q. And, Mr. Kingsbury,  
18 since I have difficulty saying this word I am going to  
19 say fenitrothion, so if I say that you will know that I  
20 mean that other one.

21 MR. KINGSBURY: A. Okay.

22 Q. All right, thank you. Now, just  
23 continuing --

24 THE CHAIRMAN: Do we have not a couple of  
25 letters that suffice for this chemical?

1 MR. CASTRILLI: I wish.

2 MR. KINGSBURY: The "F" chemical.

3 MR. MARTEL: It may not work.

4 THE CHAIRMAN: I wonder how that will  
5 come out on the transcript.

6 MR. CASTRILLI: I am glad you said that  
7 and not me. Sorry.

8 THE CHAIRMAN: Use your discretion,  
9 Reporter.

10 MR. CASTRILLI: Q. To shorten this up,  
11 Mr. Kingsbury, could I ask you to turn to page 44--

12 MR. KINGSBURY: A. Yes.

13 Q. --of the ESSA Document.

14 A. I'm there.

15 Q. We're looking at the fourth -- I'm  
16 sorry?

17 MS. MURPHY: I'm sorry, what page?

18 MR. CASTRILLI: It's at page 44.

19 MR. CASTRILLI: Q. We are looking at the  
20 fourth indented paragraph on the page--

21 MR. KINGSBURY: A. Yes.

22 Q. --beginning with "fenitrothion", and  
23 the paragraph reads that that chemical:

24 "...appears to present the greatest toxic  
25 risk to non-target wildlife and that

1                   there is at least some evidence of toxic  
2                   effects on small mammals, song birds,  
3                   amphibians at application rates less than  
4                   or equal to registered maximum levels."

5                   And then leaving a space:

6                   "There is considerable evidence of  
7                   non-target invertebrate mortality."

8                   That's a view I believe you essentially  
9                   affirmed in your evidence-in-chief?

10                  A. I essentially affirmed, although I  
11                  went on in my direct evidence to say that I would  
12                  concur with respect to song birds, although I feel that  
13                  with small mammals and amphibians the ESSA exercise  
14                  perhaps did not census all of the available literature  
15                  and I believe that if they had they would find less  
16                  evidence of toxic effects on those groups than they had  
17                  suggested.

18                  Q. And generally, Mr. Kingsbury, I take  
19                  it that this particular chemical, where it is permitted  
20                  to be applied at all, is applied by way of air --  
21                  aerially, excuse me?

22                  A. This is the chemical which has had,  
23                  since the time of the discontinuation of DDT, the  
24                  widest use of any pesticide in forestry and that has  
25                  been virtually exclusively by aerial application,

1       that's correct.

2                       THE CHAIRMAN:  So this essentially  
3       replaces DDT for similar uses?

4                       MR. KINGSBURY:  It has been used  
5       primarily as a spruce budworm larvacide and has been,  
6       in most jurisdictions but not all, and Ontario is an  
7       exception, the major insecticide used for spruce  
8       budworm control for almost two decades.

9                       MR. MARTEL:  Except for the last three or  
10      four years, Mr. Kingsbury?

11                      MR. KINGSBURY:  In the last three or four  
12      years that would be true of some jurisdictions, but  
13      still it has remained, to the best of my knowledge, the  
14      major insecticide used in Newfoundland and New  
15      Brunswick.

16                      MR. MARTEL:  I was speaking primarily of  
17      Ontario.

18                      MR. KINGSBURY:  In Ontario I don't  
19      believe fenitrothion has been the major chemical used  
20      in the last 10 years.  I could be wrong and I can look  
21      at the figures which, of course, have been presented to  
22      you.

23                      THE CHAIRMAN:  Well, where there is no  
24      chemical insecticide sprayed --

25                      MR. KINGSBURY:  In the last three years.



1 THE CHAIRMAN: In the last three years.

2 MR. KINGSBURY: But even prior to that I  
3 believe you would find that it wasn't.

4 MR. CASTRILLI: Q. Sorry, can you  
5 confirm for me, Mr. Kingsbury, that a recent  
6 Environment Canada study on the environmental effects  
7 of fenitrothion use in forestry concluded that a clear  
8 cause and effect relationship linking fenitrothion use  
9 with population decreases of honey bees and wild bees  
10 presents some of the strongest evidence against the use  
11 of fenitrothion in forests?

12 MR. KINGSBURY: A. I'd correct that  
13 statement and I would say that a recent review - it was  
14 not in fact a scientific study, it was a review of the  
15 literature - by the Environment Canada Atlantic Region,  
16 I believe they call themselves Pesticides Issue Team,  
17 makes that statement.

18 It is not a statement that was made by  
19 Environment Canada in general, and it was a review  
20 article and with those corrections, I would -- believe  
21 I agree with your statement.

22 Q. Then you know which document I'm  
23 referring to?

24 A. (indicating)

25 Q. That's right.

1 MR. CASTRILLI: Mr. Chairman, as you  
2 might imagine, I have excerpts of this report again,  
3 not the entirety of it. I may actually be able to get  
4 my hands on a complete version. I actually have a  
5 complete version but not with me. And for anyone who  
6 wants the complete version, I can certainly -- I'll  
7 give them my original for purposes of reproduction, if  
8 they like.

9 MR. KINGSBURY: Mr. Chairman, I would  
10 just indicate that I'm more than prepared to deal with  
11 the entire document.

12 THE CHAIRMAN: Very well.

13 MR. CASTRILLI: Q. Mr. Chairman --  
14 excuse me, Mr. Kingsbury, I previously provided you  
15 with excerpts of that document; is that right?

16 MR. KINGSBURY: A. Yes.

17 MR. CASTRILLI: Mr. Chairman, I would ask  
18 that it be made the next exhibit.

19 THE CHAIRMAN: Okay, that will be Exhibit  
20 762.

21 ---EXHIBIT NO. 762: Excerpts from a document entitled:  
22 Environmental Effects of  
23 Fenitrothion Use in Forestry,  
dated March, 1989.

24 THE CHAIRMAN: Is this chemical, Mr.  
25 Kingsbury, used in Ontario in other than aerial

1 forestry applications still?

2 MR. KINGSBURY: Mr. Chairman, I don't  
3 believe this chemical has been used in Ontario for  
4 anything other than forestry applications, and I  
5 believe that's true of all of Canada. It is, however,  
6 used in the range of use patterns in other countries on  
7 other, mostly agricultural crops.

8 THE CHAIRMAN: All right. And in the  
9 last three years it isn't used for forestry, at least  
10 applied aerially here; is that correct? We use BTs for  
11 insecticides; do we not?

12 MR. KINGSBURY: That's absolutely correct  
13 and I was only hesitating as whether it's three years,  
14 it may in fact be four.

15 THE CHAIRMAN: Whenever the date was, I  
16 think it was '85 or '86. But in any event, what's the  
17 relevance of looking at this chemical if its use in  
18 Ontario for forestry is presumably not an issue?

19 MR. KINGSBURY: It is one of the few  
20 materials that is still federally registered for major,  
21 particularly spruce budworm, but for spruce budworm and  
22 other major forest pests in Canada.

23 There is -- it is still available for use  
24 in Ontario, although through the process we have  
25 discussed of the requirement for a provincial permit,

1 Ontario may choose not to use it.

2 THE CHAIRMAN: So in the event that it is  
3 used, we are looking at its effects; is that basically  
4 your position, Mr. Castrilli?

5 MR. CASTRILLI: Mr. Chairman, if it  
6 wasn't in the --

7 MS. MURPHY: That is the Ministry of  
8 Natural Resources' position as well, sir.

9 THE CHAIRMAN: Sorry?

10 MS. MURPHY: The information was provided  
11 in the ESSA Document. This is a registered product.  
12 You have heard the evidence of the actual use in  
13 Ontario to date and this is an Environmental Assessment  
14 and we are dealing with the registered products.

15 THE CHAIRMAN: All right.

16 MR. CASTRILLI: Mr. Chairman, you can  
17 take it as a given that if it was not referred to in  
18 the ESSA Document I would not be taking up the Board's  
19 time with it.

20 MS. CRONK: I can tell the Board as well,  
21 Mr. Chairman, as I've indicated in the past, and  
22 perhaps not as clearly as I should have, that it is the  
23 position of our clients that those insecticides  
24 currently bearing registration status should be  
25 maintained and used in appropriate circumstances in

1 Ontario. And, further, that there should be a  
2 continuing commitment to detailed and appropriate  
3 research to promote the registration of other  
4 appropriate insecticides.

5 It is very much an issue from our  
6 client's point of view.

7 THE CHAIRMAN: Very well.

8 MR. CASTRILLI: Q. Sorry, Mr. Kingsbury,  
9 referring to page 7 of what is now Exhibit 762.

10 MR. KINGSBURY: A. Page seven-zero or  
11 seven?

12 Q. Seven.

13 A. Yes.

14 Q. Just looking at the summary under the  
15 heading: Insect Pollinators which, Mr. Kingsbury, can  
16 you confirm for me when this report talks about insect  
17 pollinators it is referring to honey bees and wild  
18 bees?

19 A. That's correct.

20 Q. Is that right?

21 A. That's basically correct, although it  
22 also includes a number of non-bee pollinators such as  
23 wasps, butterflies, et cetera. Basically almost all of  
24 the data in it in fact deals with honey bees and bumble  
25 bees.



1 Q. The pollinator review presents --  
2 sorry, the authors of the report, who are, as you  
3 indicated, with the Pesticides Issue Team of the  
4 Conservation and Protection Directorate of Environment  
5 Canada's Atlantic Region indicate that the review with  
6 respect to pollinators presents some of the strongest  
7 evidence against the use of fenitrothion in forests.

8 A. Okay. Just to correct that, the  
9 editors of the report, who are in fact the authors I  
10 believe of this overview section, draw that conclusion  
11 on the basis of Section 3 which is in fact authored --

12 Q. Chapter 2 you mean?

13 A. Or Chapter 2, which is in fact  
14 authored by -- if you just give me a moment to --

15 Q. P.G. Kevan and R.C. Plowright?

16 A. Kevan and Plowright, yes, who are in  
17 fact not with Environment Canada, they're both  
18 university researchers here in Ontario.

19 Q. Mr. Kingsbury, just so we're clear  
20 about this document, this is a document published by  
21 Environment Canada; is that right?

22 A. That's correct. I'm just pointing  
23 out that the people you mentioned are the editors not  
24 the authors of what you're referring to.

25 Q. That's fine, but they are summarizing

1 the contents of the chapter on insect pollination; is  
2 that right?

3 A. Absolutely.

4 Q. Now, having done that digression, can  
5 we return to the question I asked.

6 A. If you'll pardon me, Mr. Castrilli, I  
7 think it's an important digression because I think  
8 there's a difference between what the authors who have  
9 carried out the scientific review of the literature say  
10 and what the editors who are summarizing what that  
11 chapter says, and I would point that out.

12 THE CHAIRMAN: So you don't agree that  
13 this is a valid or correct summary of what the authors  
14 in fact drew as conclusions; is that what you're  
15 saying?

16 MR. KINGSBURY: I'm pointing out that  
17 what is said here is said by editors not by the  
18 authors.

19 THE CHAIRMAN: No, but do you agree --  
20 you are indicating that they didn't get it right; is  
21 that not what you are saying?

22 MR. KINGSBURY: I would deal like to -- I  
23 would deal with that on a point-by-point basis, okay.

24 MR. CASTRILLI. Q. Mr. Kingsbury, just  
25 so you're clear, my understanding is that Environment

1 Canada on the basis of this report requested  
2 Agriculture Canada to undertake a re-evaluation of  
3 fenitrothion forestry use patterns; isn't that correct?

4 MR. KINGSBURY: A. That they requested  
5 Agriculture Canada to undertake...?

6 Q. A re-evaluation of fenitrothion  
7 forestry use patterns as a result of this report?

8 A. It was actually a -- that's what they  
9 called it, it was actually requesting a re-evaluation  
10 of the registration package.

11 Q. And that was Environment Canada that  
12 made that request as a result of this report; is that  
13 right?

14 A. I'm not aware whether -- I know that  
15 that's what the document says and that Agriculture  
16 Canada have in fact acted on that.

17 Again, when you say Environment Canada, I  
18 believe that it was the Pesticides Issue Team of the  
19 Atlantic Region of Environment Canada that made that  
20 request. Again, I think that's an important  
21 distinction because we will recognize that Environment  
22 Canada also has a group in Ottawa who are in fact  
23 advisors to the registration process.

24 Q. Mr. Kingsbury, are you familiar with  
25 the Newsletter of the Forest Pest Management Institute?

1 A. Yes, I am.

2 Q. It is published by Forestry Canada?

3 A. That's right.

4 Q. And you used to work at the Forest  
5 Pest Management Institute?

6 A. That's correct.

7 Q. Are you familiar with the Spring  
8 edition -- Spring, 1989 edition of that Newsletter?

9 A. I believe I have seen that.

10 MR. CASTRILLI: And actually, Mr.  
11 Chairman, I hadn't planned on making this an exhibit, I  
12 didn't believe we'd have to do this, but I am prepared  
13 to reproduce the excerpts -- actually, I will produce  
14 the entire article that deals with this matter, it's  
15 only two pages, and provide you with, and other  
16 parties, copies of it at an appropriate point this  
17 afternoon.

18 Q. Just reading from the Spring, 1989  
19 edition, Mr. Kingsbury, this was written by the Forest  
20 Pest Management Institute; is that right, it's the  
21 Institute's Newsletters?

22 MR. KINGSBURY: A. It would emanate  
23 within the Institute, that's correct.

24 Q. Looking at page 4 and simply -- I'm  
25 just going to read to you the paragraph:

1 "The report..."

2 And the report they are referring to is  
3 what is now Exhibit 762.

4 A. All right.

5 Q. "...raises questions regarding  
6 the acceptability of continued large  
7 scale spraying of fenitrothion at  
8 currently registered rates because of  
9 perceived potential impacts on  
10 pollinators, pollination and song bird  
11 populations. As a result, Environment  
12 Canada has requested that Agriculture  
13 Canada undertake a re-evaluation of  
14 fenitrothion forestry use patterns."

15 Now, Mr. Kingsbury, would you agree with  
16 me - you will be able to have a copy of this in  
17 appropriate time - that that was a request made by  
18 Environment Canada and not simply three authors of this  
19 study?

20 A. That's right. I would -- and, Mr.  
21 Castrilli, I can't tell you precisely who that request  
22 came from. I attempted to find out, for the purpose of  
23 completeness of my evidence at this hearing, who within  
24 Environment Canada made that request because it may  
25 have some bearing on how the Board sees this particular



1 request.

2 THE CHAIRMAN: Well, Mr. Kingsbury,  
3 surely in fairness to the system of government we  
4 have--

5 MR. KINGSBURY: Yes.

6 THE CHAIRMAN: --you have an agency  
7 called Environment Canada.

8 MR. KINGSBURY: Yes.

9 THE CHAIRMAN: You have an authorized  
10 official or an official within that agency who is a  
11 dually authorized employee with some duties and they  
12 make a request of another agency on behalf of their  
13 employer--

14 MR. KINGSBURY: Mm-hm.

15 THE CHAIRMAN: --which is Environment  
16 Canada, the normal everyday assumption by anyone on the  
17 outside would be that it is a request from Environment  
18 Canada.

19 MR. KINGSBURY: That's correct.

20 THE CHAIRMAN: It certainly doesn't have  
21 to come from the Minister of the Environment or a  
22 specific official to be an official Environment Canada  
23 request; does it?

24 MR. KINGSBURY: That's right. But I'm  
25 not sure whether this request came from the pesticide

1 review body within Environment Canada. Now, maybe I am  
2 splitting hairs here, Mr. Chairman.

3 THE CHAIRMAN: But this is a group that  
4 deals with pesticides issues.

5 MR. KINGSBURY: Yes.

6 THE CHAIRMAN: It is an issue team, or so  
7 represented to be.

8 MR. KINGSBURY: A regional...

9 THE CHAIRMAN: A regional team.

10 MR. KINGSBURY: Yes.

11 THE CHAIRMAN: So surely, in effect,  
12 Environment Canada sort of can't have its cake and eat  
13 it too, it can't sort of deny the existence of a  
14 group--

15 MR. KINGSBURY: I am very sensitive --

16 THE CHAIRMAN: --under its auspices, you  
17 know, that can go around and indicate that they are  
18 speaking for Environment Canada.

19 MR. KINGSBURY: I am very sensitive to  
20 this issue, Mr. Chairman, because Canadian Forestry  
21 Service used to be part of Environment Canada and we  
22 have been around this issue many times.

23 Perhaps I have belaboured the point and I  
24 will accept Mr. Castrilli's contention that Environment  
25 Canada have in fact asked for and Agriculture Canada

1 have responded to this request to have a review of the  
2 registration data.

3 THE CHAIRMAN: Okay. Maybe we can move  
4 along, unless there is something else you want to  
5 explore.

6 MR. CASTRILLI: Just one other point with  
7 respect to this issue.

8 Q. You would agree with me, Mr.  
9 Kingsbury, that Agriculture Canada has in fact agreed  
10 to this review?

11 MR. KINGSBURY: A. They have agreed to a  
12 review limited to the, basically the environmental  
13 toxicology and fate portions of data package. And I  
14 believe that all parties involved in the registration  
15 process have said that this will not include human  
16 health considerations, and perhaps Dr. Ritter could  
17 confirm that.

18 Q. I didn't ask you that question, Dr.  
19 Ritter.

20 DR. RITTER: A. Okay. No, that's  
21 correct. The re-evaluation will be driven virtually  
22 exclusively on the basis of environmental concerns.

23 Q. Okay. Mr. Kingsbury...

24 MS. BLASTORAH: Mr. Chairman, perhaps we  
25 should reserve an exhibit number for the document Mr.

1       Castrilli was going to provide.

2                   MR. CASTRILLI:  I don't even know what  
3       number we are at.  I think it is 763.

4                   THE CHAIRMAN:  763.  Could you give us  
5       again what that is?

6                   MR. CASTRILLI:  Yes, Mr. Chairman.  It's  
7       the Newsletter of the Forest Pest Management Institute.  
8       It is No. 8 -- sorry, it's Volume 8, No. 1, Spring,  
9       1989 and the excerpt I will be giving you is the  
10      article on this report which begins at -- well, it  
11      begins at page 3 and ends at page 4.  It is two pages.

12                  THE CHAIRMAN:  Thank you.

13      ---EXHIBIT NO. 763:  Two-page excerpt of Forest Pest  
14                               Management Institute Newsletter,  
                              Volume 8, No. 1, Spring, 1989.

15                  MR. CASTRILLI:  Q.  Page 7, Mr.  
16      Kingsbury?

17                  MR. KINGSBURY:  A.  Yes.

18                  Q.  "The pollinator review presents some  
19                       of the strongest evidence against the use  
20                       of fenitrothion in forests."

21                  Do you agree with that assessment?

22                  A.  I would agree that the area of  
23      impacts of fenitrothion on pollinators is perhaps one  
24      of the areas where there is the greatest concern  
25      regarding significant -- occurrence of significant

1 environmental impacts in forest eco-systems.

2 In the context that these reviews have  
3 basically reviewed three areas; namely, pollinators,  
4 forest song birds and aquatics, I would agree that that  
5 is the area where there is perhaps the greatest  
6 concern.

7 Q. Sorry, when you say "that is the  
8 area", you mean--

9 A. Pollinators.

10 Q. --pollinators. Thank you.

11 A. Yes.

12 Q. Sorry, were you finished with your  
13 answer?

14 A. I basically would say that is the  
15 area where there is the most evidence indicating  
16 greatest concern.

17 MS. MURPHY: I really -- I have been  
18 thinking about this and I hate to interrupt, but I'm  
19 just concerned about some confusion that may be left  
20 right at this time. It may be something that is not  
21 understood and, in fairness to everyone here, I think  
22 it would be wise to try to clear up.

23 Based on evidence that's already been  
24 submitted, the significance of the discussion that took  
25 place a few minutes ago about which part of Environment



1 Canada is involved there is, as a matter of procedure  
2 and procedural things that you've heard about in  
3 evidence-in-chief, some significance to this matter.

4 May I just suggest to you that that is as  
5 follows: That on the basis of this review there was a  
6 request, and it matters not by whom, to Environment  
7 Canada to initiate a review of the data package. The  
8 important --

9 THE CHAIRMAN: To Agriculture Canada.

10 MS. MURPHY: Agriculture Canada, that's  
11 right. The important thing, if you will recall the  
12 evidence that was put in in-chief and subsequently,  
13 that the review is then conducted with the assistance  
14 of various agencies of the Federal Government, one of  
15 them being Environment Canada.

16 What that means is that because the  
17 review is now, as I understand it, underway one of the  
18 people -- one of the organizations that will reviewing  
19 the data is a group in Environment Canada not  
20 necessarily the people who wrote this document.

21 I think that was the significance of the  
22 exchange that took place earlier that may have been  
23 missed, that Environment Canada has yet to review this  
24 and other information and to provide that information  
25 then back to Agriculture Canada.

1                   THE CHAIRMAN: And it will be a report  
2                   that emanates essentially from Agriculture Canada as to  
3                   the results of the review, notwithstanding the input to  
4                   that review might have come from a different section of  
5                   Environment Canada?

6                   MS. MURPHY: Correct. And Environment  
7                   Canada then will be asked to comment on this along with  
8                   various other agencies. And I think it is important at  
9                   this stage not to leave the confusion that may have  
10                  been left.

11                  MR. CASTRILLI: Mr. Chairman, there isn't  
12                  any confusion. The document I was reading from clearly  
13                  indicates that Environment Canada requested  
14                  re-evaluation, Agriculture Canada agreed, and it is a  
15                  document that's summarized -- or it's a series of  
16                  events summarized in a document published by the Pest  
17                  Management -- Forest Pest Management Institute.

18                  MS. MURPHY: Fair enough.

19                  MR. CASTRILLI: So I don't know what we  
20                  are having a discussion about, quite frankly.

21                  MS. MURPHY: Fair enough. I'm just  
22                  pointing out that it's important to understand what  
23                  happens next. That's all.

24                  MS. SEABORN: Mr. Chairman, for the  
25                  purposes of the record, perhaps Mr. Kingsbury could

1       either adopt what Ms. Murphy has just said into the  
2       record or correct it, because I have difficulty when I  
3       go back and look at the transcript when we have a long  
4       statement by counsel, whomever it is, and it's not  
5       really properly evidence before you.

6               So I would like to have Mr. Kingsbury  
7       either explain what the process is again or confirm  
8       what Ms. Murphy has said.

9               THE CHAIRMAN: Well, without going  
10      through it again, let's try and short circuit that.

11              You've heard what Ms. Murphy has said.  
12      Do you agree that the statement she made, in your  
13      understanding, are correct of what is going to happen  
14      next?

15              MR. KINGSBURY: I would agree with it and  
16      I would make -- say that perhaps the germane portion of  
17      that is that the people within Environment Canada who  
18      have the formal responsibility to advise Agriculture  
19      Canada concerning the data package on fenitrothion are  
20      not the people that have made these statements.

21              THE CHAIRMAN: It is the group in Ottawa?

22              MR. KINGSBURY: It is the regional  
23      Pesticides Issue Team in the Maritime provinces.

24              MRS. KOVEN: Well, let's get this clear  
25      then: Is the suggestion that the group who in effect

1 do the review for Agriculture Canada, they could refute  
2 the work that was done and submitted by Environment  
3 Canada through this group?

4 MR. KINGSBURY: Not only that, but they  
5 would be working with potentially quite a different  
6 database; namely, that the Pesticide Issues Team did  
7 not have access to the data submission, the  
8 registration submission and all the company data  
9 included in that.

10 MRS. KOVEN: So you are raising this  
11 because you think that's what's going to happen?

12 MR. KINGSBURY: I wouldn't forecast  
13 what's going to happen. I simply want to -- we have  
14 had a lot of dealing here with the EPA - who, of  
15 course, are responsible for registration of pesticides  
16 in the United States - have said this.

17 That carries some weight, and I just want  
18 to reinforce to the Board that statements that are made  
19 here are not made by the portion of Environment Canada  
20 who comment and provide advice to Agriculture Canada.

21 THE CHAIRMAN: Okay. I think we have  
22 that straight at this point.

23 We have it straight, thank you.

24 Mr. Castrilli?

25 MR. CASTRILLI: Mr. Chairman, it's

1 becoming increasingly doubtful I'm going to finish  
2 today.

3 Q. Now, Mr. Kingsbury, page 7, the first  
4 paragraph under the heading of: Insect Pollinators, do  
5 you agree with the statement that some of the strongest  
6 evidence against the use of fenitrothion in forests is  
7 presented in the  
8 pollinator review; yes or no?

9 MR. KINGSBURY: A. I'm not going to give  
10 you a yes or no answer because I don't think the  
11 evidence that is presented in this is evidence against  
12 the use of fenitrothion, it is evidence regarding the  
13 nature of the effects of fenitrothion and I would agree  
14 that, with the evidence that has been reviewed in the  
15 area of pollinator effects, is in fact the evidence  
16 that has the most bearing to the significant ecological  
17 effects of fenitrothion spraying, if they in fact  
18 occur.

19 Q. The first bulleted paragraph  
20 underneath the boldface:

21 "A clear cause and effect relationship  
22 has linked fenitrothion use with  
23 population decreases of honey bees and  
24 wild bees."

25 Do you agree with that statement?



1                   A. No, I do not agree with it. First of  
2 all, I believe that you will find there is very little  
3 to substantiate population decreases of honey bees  
4 included in the review, and I reviewed that information  
5 myself briefly.

6                   With respect to wild bees, I do not agree  
7 that a clear cause/effect relationship has linked  
8 fenitrothion use with population decreases of wild  
9 bees. There is definitely evidence presented in this  
10 that points to the association of fenitrothion spraying  
11 and some population decreases of some wild bees in some  
12 instances.

13                  Q. Page 8.

14                  A. Yes.

15                  Q. We are now dealing with song birds.

16                  A. Yes.

17                  Q. The summary indicates -- or the  
18 boldfaced part of this indicates:

19                         "The evidence indicates that fenitrothion  
20 poses a considerable risk to protected  
21 migratory song birds and casts doubt on  
22 the advisability of broad-scale spraying  
23 of this insecticide in forestry."

24                  Do you agree with that assessment?

25                  A. No, I do not agree with that

1 assessment. There have been perhaps as many or more  
2 studies in this particular area carried out than any of  
3 the other areas and, in fact, the majority of these  
4 studies have been carried out during the period in the  
5 mid-70s when the use pattern of fenitrothion was most  
6 extensive. In fact, at some points it was about 20  
7 times more extensive than is currently the case.

8 And the majority of that data led to, and  
9 the lack of any regulatory action for a period of some  
10 15 years since that time, to my mind, reinforces the  
11 fact that there is not evidence that fenitrothion as  
12 applied in forestry poses a considerable risk to  
13 protected migratory song birds.

14 I don't believe we would still be using  
15 the material if in fact in the weight of evidence that  
16 was present most, of which as I would suggest was  
17 present certainly by the end of the 1970s, indicated  
18 that.

19 Q. Would you agree with me, Mr.  
20 Kingsbury, that the chapter that was written on song  
21 birds from which this conclusion is derived included  
22 Pierre Mineau who was one of the ESSA reviewers?

23 A. As an author?

24 Q. Of the chapter. It's chapter 3, page  
25 43.

1 A. That's correct.

2 Q. Your answer is...?

3 A. That is correct.

4 Q. Now, I wonder if I might ask you,  
5 rather than having me read all of these items that  
6 appear on page 8, if you could take a moment to just  
7 read the seven bulleted items and then indicate whether  
8 you agree with each paragraph and, if not, why not?

9 A. Okay. The first item talks about  
10 sporadic observed mortality of the most vulnerable and  
11 sensitive song birds being associated with fenitrothion  
12 spraying in forests. I would turn you - and I don't  
13 know if the Board has this table present, I'm not sure  
14 they do.

15 Q. If it's not in the excerpt, then the  
16 answer would be no.

17 A. On page 91 there is in fact a table  
18 entitled: Birds Found Sick Moribund or Dead in Spray  
19 Blocks after Fenitrothion Spraying of Forests in New  
20 Brunswick, Newfoundland and Maine, 1967 to 1987.

21 This encompasses some 20 years of spray  
22 use in three jurisdictions and it indicates that in  
23 that time there have been 64 song birds found dead. It  
24 indicates that since 1977 there have been three song  
25 birds found dead in fenitrothion sprayed areas.

1                   To me those figures do not support the  
2                   conclusion that there has, in fact, been considerable  
3                   mortality of song birds associated with fenitrothion  
4                   spraying. I would suggest that in that period there  
5                   has been over 20.-million hectares of fenitrothion  
6                   spraying in those jurisdictions.

7                   Q. The second paragraph, second bulleted  
8                   paragraph.

9                   A. The second paragraph talks about  
10                  evidence of reduction in brain cholinesterase activity.  
11                  Dr. Ritter has referred to this. It's an enzyme  
12                  involved in nerve transmission and it suggests that  
13                  evidence of 50 per cent reduction in brain  
14                  cholinesterase activity is a better indication of  
15                  mortality in the population at large than is the  
16                  finding of dead or moribund birds.

17                  There have been a large variety of field  
18                  studies looking at cholinesterase inhibition.

19                  THE CHAIRMAN: Well, just hold on a  
20                  second. Mr. Kingsbury, if you are going to be  
21                  referring to parts of this exhibit or parts of the  
22                  study that you are looking at that we don't have and  
23                  other counsel don't have, I think we are going to have  
24                  to stop and wait until we get a copy of that report.

25                  MS. CRONK: Sir, to assist you, that

1 particular quote was found on page 8 which is in the  
2 extract.

3 THE CHAIRMAN: That is in the extract?

4 MR. CASTRILLI: I'm sorry I didn't  
5 realize you didn't realize that.

6 MS. CRONK: It's the third paragraph,  
7 left-hand column on page 8.

8 THE CHAIRMAN: No, I realize that, but  
9 he's then going to another area of the document to back  
10 up your contention of how this should be interpreted;  
11 is that not correct?

12 MR. KINGSBURY: Well, I certainly feel  
13 that it's essential in that I think that these  
14 conclusions are drawn from them.

15 THE CHAIRMAN: Well, it was my  
16 understanding -- we just went through a table that we  
17 didn't have in front of us and it looks like he's going  
18 to do the same thing with the next paragraph. So I  
19 thought perhaps we should have the whole document in  
20 front of us and everybody else.

21 MS. CRONK: Rather than stand down, sir,  
22 I can provide the Board with a copy of it as soon as  
23 Mr. Cassidy returns, but I only have one copy of the  
24 whole version.

25 MS. MURPHY: And, unfortunately I only



1 have one copy of the whole version.

2 THE CHAIRMAN: Well, if the Board had one  
3 and --

4 MR. CASTRILLI: Mr. Chairman, I have a  
5 full copy I can probably provide the Board.

6 THE CHAIRMAN: Okay. As long as we have  
7 one copy, I think that would be sufficient.

8 MR. CASTRILLI: Sorry, I don't have it  
9 now.

10 MS. MURPHY: You might use this one.

11 MR. KINGSBURY: Mr. Chairman, I will try  
12 and restrict my comments to direct referral to portions  
13 you have, or indicate evidence which is not before you.

14 And I might just, in beginning this,  
15 refer you to an earlier portion of this document which  
16 says that -- on page 5, the beginning of the synopsis.  
17 I believe you have that portion.

18 THE CHAIRMAN: Yes.

19 MR. KINGSBURY: The second sentence, it  
20 says:

21 "In fact, the environmental database for  
22 fenitrothion developed during the past 20  
23 years of operational use is probably  
24 greater than that for any other  
25 insecticide in Canadian commerce."

1                   I would agree with that statement and I  
2                   would also suggest that my comments represent a  
3                   compilation of that database with which I believe I am  
4                   intimately acquainted through my personal involvement  
5                   in generating much of it and being exposed to other  
6                   people who have done it over the last 15 years.

7                   That may not -- you know, there may be  
8                   times when you want to see things in print, but I will  
9                   be drawing on a very extensive database.

10                  Can I carry on? And feel free to stop me  
11                  any time you feel that something needs to be  
12                  substantiated.

13                  THE CHAIRMAN: Very well.

14                  MR. CASTRILLI: Q. Mr. Kingsbury, just  
15                  so I'm clear where you are going, you are now going to  
16                  be commenting on the second full paragraph, second  
17                  bulleted paragraph under...

18                  MR. KINGSBURY: A. Cholinesterase  
19                  inhibition, that's correct.

20                  I could refer to the Board a document  
21                  that I prepared in January of 1988 which deals with  
22                  this which could be made available, I believe, by  
23                  counsel to them.

24                  This attempts to address many of the  
25                  issues that have been brought up here because, as you

1        imagine, this is not an issue that came out of the blue  
2        and, in fact, results from a long-standing dialogue on  
3        this topic.

4                    Q.   Mr. Kingsbury, just so I'm clear and  
5        it's clear for the record, can you identify what you  
6        are reading from?

7                    A.   It's called:   Fenitrothion Avian  
8        Impact, and there's a file Report No. 91 of the Forest  
9        Pest Management Institute authored by myself.

10                   Q.   Is that a public document?

11                   A.   It's a public document.

12                   Q.   Was it dealt with or is it listed in  
13        the references of what is now Exhibit 762?

14                   MS. MURPHY:   Exhibit 762.

15                   MR. KINGSBURY:   That is the  
16        fenitrothion...?

17                   MR. CASTRILLI:   Q.   That's right.

18                   THE CHAIRMAN:   Ms. Murphy, are we going  
19        to...

20                   MS. MURPHY:   I know that the bibliography  
21        to that document lists several studies authored by Mr.  
22        Kingsbury.   I might just have a look and see.

23                   MR. KINGSBURY:   No, it is not included in  
24        there.   That doesn't surprise me because the  
25        conclusions I draw deal with the same database but come

1 to very different end points.

2 This document, in fact, is based on a  
3 presentation that I made in November of 1987 to a  
4 number of bodies, including regional bodies in the  
5 Maritime Provinces and the National Forest Pest Control  
6 forum that deal with these types of issues.

7 THE CHAIRMAN: Well, I think we better  
8 exhibit that, if you are going to be referring to it.

9 If you only have one copy there at this  
10 point, we will give it a number and you can read from  
11 it and we will have it available afterwards. Ms.  
12 Murphy, you can provide that at some point?

13 MS. MURPHY: Yes, I will do that.

14 THE CHAIRMAN: All right. Exhibit 764.

15 ---EXHIBIT No. 764: Document entitled: Fenitrothion  
16 Avian Impact, Report No. 91,  
17 Forest Pest Management Institute  
authored by P. Kingsbury.

18 MR. KINGSBURY: Okay. If I can attempt  
19 to summarize this as succinctly as possible, and I  
20 recognize that may be a problem for me.

21 When fenitrothion or other cholinesterase  
22 inhibiting pesticides - basically you are talking about  
23 insecticides - are applied to forest areas, one of the  
24 things that one can measure is an inhibition of  
25 cholinesterase in various organisms. This is, in fact,

1 the mode of activity in the target organism. It's also  
2 measurable in things like forest song birds.

3 There have been a lot of studies  
4 measuring this parameter in song birds after forest  
5 spraying with fenitrothion and other chemical  
6 insecticides. The results are usually expressed in  
7 terms of a per cent by which the activity of this  
8 enzyme is reduced over a pre-spray or a control level  
9 of activity. Those measurements have often been done  
10 and they often show inhibitions over a wide range of  
11 areas. Okay.

12 The interpretation of what the  
13 significance of these degrees of inhibition mean is a  
14 matter of much debate. There are, within the  
15 scientific literature, some very general statements  
16 that have been made, have been widely used, and have  
17 been widely misused as well.

18 The best known of these generalizations  
19 are that a measurement of 20 per cent inhibition  
20 indicates exposure to a cholinesterase inhibitor such  
21 as fenitrothion. It's an indication of exposure.

22 What that is saying is that, in general,  
23 you wouldn't see levels that far below sort of the mean  
24 or background levels unless there had been an  
25 interaction with a cholinesterase inhibitor.



1                   But that is not always true because we  
2                   know in unsprayed plots we have measured this, but it's  
3                   generally true. I have no argument with it generally.

4                   There is also statements that indicate  
5                   that 50 per cent inhibition is indicative of a  
6                   life-threatening situation, and I believe that is the  
7                   statement that these authors are using to base their  
8                   statement here saying that evidence of 50 per cent  
9                   reduction is a better indication of mortality.

10                  The first point I would make is that  
11                  every time a song bird, almost without exception, a  
12                  song bird has been collected from a fenitrothion  
13                  sprayed area exhibiting that level or greater, 50 per  
14                  cent or greater inhibition that bird has in fact been  
15                  behaving normally, that it was found because of its  
16                  singing activities which appeared normal.

17                  And these are the conclusions of the  
18                  authors of studies, most of which were conducted by  
19                  Messrs. Busby and Pearce who are authors of this  
20                  section of the review document, and that is their  
21                  words. They have never reported that these birds that  
22                  were collected were showing any abnormal behaviour.

23                  To me that says something very strongly  
24                  about the fact -- whether 50 per cent inhibition is in  
25                  fact an indication of mortality, which they are

1 suggesting here. The inhibition is a reversible  
2 process. We know that birds recover, that the activity  
3 of this enzyme recovers over time.

4 It indicates -- it talks about being an  
5 indicator of mortality in the population. There are  
6 years of studies based on the best census methodologies  
7 available, including studies by the Canadian Wildlife  
8 Service that says we cannot find population level  
9 effects in fenitrothion sprayed forests at the level as  
10 contemplated for use in Ontario or, in fact, at levels  
11 up to five or six times that rate of application.

12 I guess -- would you like me to move on  
13 to the next point, Mr. Castrilli?

14 MR. CASTRILLI: Q. If you have read it.

15 MR. KINGSBURY: A. The study says that  
16 in every recent brain cholinesterase monitoring study,  
17 some birds with at least 50 per cent inhibition were  
18 documented and that the proportion of sample birds with  
19 that level has been as high as 55 per cent, and I would  
20 agree with that.

21 It goes on to say:

22 "That indicates that mortality in  
23 operational spray programs has probably  
24 been higher than observations of avian  
25 Casualties previously indicated."

1                   And given that I have already refuted the  
2 fact that that degree of inhibition is necessarily  
3 linked to mortality, I would of course refute this  
4 conclusion.

5                   Q. And, Mr. Kingsbury, your refutation,  
6 as it were, is in the document you were quoting from?

7                   A. Yes, I believe you will find my  
8 arguments in there.

9                   Q. Paragraph 4?

10                  A. Paragraph 4 says that:

11                         "Severe reproductive impairment in a  
12                         typical forest song bird, the  
13                         white-throated sparrow, was associated  
14                         with a mean brain cholinesterase  
15                         inhibition of 42 per cent."

16                   If you give me just a moment to look in  
17 my document to find where I have addressed this.

18                   This statement is largely supported,  
19 although it is widely quoted, and you will see it cited  
20 in a number of places. It is my belief that the  
21 citation goes back to an undergraduate thesis usually  
22 cited as Peter's 1979 from the University of New  
23 Brunswick, Faculty of Forestry. It's entitled: Growth  
24 Rates of White-throated Sparrow Chicks on a  
25 Fenitrothion Sprayed and Unsprayed Plot in Northeastern

1 New Brunswick.

2 It is not a refereed document, it is not  
3 available from the University of New Brunswick, it is  
4 an undergraduate, a B.Sc. thesis.

5 There have been other studies looking at  
6 reproductive impairment in both lab and field  
7 situations. One of the most recent was carried out  
8 under my direction at the Forest Pest Management  
9 Institute under laboratory situations which we would  
10 acknowledge do not necessarily replicate field  
11 situations, but it involved dosing birds to  
12 intestinally induce 50 per cent cholinesterase  
13 inhibition and higher and then following through a  
14 reproductive cycle to look for their eventual  
15 reproductive success.

16 It would certainly not -- would  
17 indirectly give evidence suggesting that although it  
18 didn't deal with white-throated sparrow in field  
19 situations, that this conclusion here is necessarily  
20 based on the best available scientific evidence.

21 Q. Mr. Kingsbury, just so I'm clear on  
22 your answer. Page 48 of Exhibit 762 --

23 A. Yes.

24 Q. The last paragraph on the right-hand  
25 column?

1 A. That's correct.

2 Q. Is that paragraph based on the B.Sc.  
3 study, or is that based on something else, or do you  
4 know? It's the paragraph beginning:

5 "In white-throated sparrows..."

6 A. Yes, I'm reading it, and it's not --  
7 there isn't a citation there and I'm just trying to  
8 assure myself that I am aware of what the source would  
9 be. I believe what you will find here is it says:

10 "A mean inhibition found in birds exposed  
11 to the same spray as those exhibiting a  
12 range of effects."

13 And I believe what you will see here is  
14 that we are talking about two studies, one on effects,  
15 one on cholinesterase inhibition.

16 It is of course -- and one of the biggest  
17 impairments to our understanding in this areas, you  
18 have to kill the bird to measure cholinesterase  
19 inhibition. You can, therefore, not see what the  
20 effects of that inhibition are on the bird. You always  
21 have to be working indirectly by basically suggesting  
22 that the birds have the degree of inhibition -- a  
23 certain degree of inhibition.

24 That is why we go to a lab study where we  
25 are capable of dosing a large group of birds with the



1 same dose, sacrificing a sample of them where we  
2 measure the inhibition, and then continuing to make  
3 biological observations on the remaining sample, making  
4 the assumption that they have received the same dose  
5 and fall within the same range of inhibition as the  
6 birds that have been sacrificed.

7 Does that answer your question, Mr.  
8 Castrilli?

9 Q. My question was: Is the last  
10 paragraph on page 48 based, to your knowledge, if you  
11 know, on the undergraduate thesis you are referring to,  
12 or is it based on other information?

13 A. It would not be based exclusively on  
14 that undergraduate thesis.

15 Q. Thank you. In looking at that  
16 paragraph, the authors indicate -- let me just read the  
17 entire paragraph:

18 "In white-throated sparrows, amine brain  
19 cholinesterase depression of 42 per cent  
20 was found in birds exposed to the same  
21 spray as those exhibiting a broad range  
22 of effects including mortality of adults  
23 and young nest desertion, desultory  
24 incubation and ultimately lowered  
25 reproductive success. That observation

1 argues for placing a limit of  
2 acceptability on brain cholinesterase  
3 activity depression averaging 40 to 50  
4 per cent in the sample bird population.  
5 Under that criterion, continued  
6 broad-scale use of fenitrothion in  
7 forestry is questionable since that level  
8 of brain cholinesterase depression is  
9 regularly found in birds sampled in  
10 forests sprayed with fenitrothion."  
11 Do you agree or disagree with that  
12 assessment?

13 A. Again, I would tend to disagree very  
14 strongly with that assessment in that the vast majority  
15 of the birds that have been sampled showing that degree  
16 of inhibition have not shown abnormal behaviour, in  
17 fact they have been singing males engaged in defending  
18 their territory by the use of song which is, of course,  
19 an integral part of their reproductive activity.

20 Q. Sorry, and you rely for that  
21 statement on what study?

22 A. I rely on that statement on a large  
23 body of studies most of which are done by the authors  
24 of this report, Busby and Pearce.

25 Q. Sorry. You rely on Busby and

1 Pearce's work in this area to come to a conclusion  
2 contrary to the one they did?

3 A. That's correct.

4 Q. Perhaps at an appropriate time you  
5 could just provide the Board and myself with a list -  
6 it doesn't have to be exhaustive - but the key  
7 documents you believe support your view and  
8 interpretation of the Busby and Pearce studies?

9 A. I would simply refer you to any of  
10 their studies documenting brain cholinesterase  
11 depression in birds. And by the -- either the  
12 statements which are there saying, all birds collected  
13 showed no indications of abnormal behaviour, or the  
14 lack of any statement referring to any abnormal  
15 behaviour by those birds, in fact supports my  
16 statement.

17 There are also studies done by a number  
18 of other groups including ours of course.

19 Q. Well, I think my request would stand.  
20 If you can provide me a list with what it is you rely  
21 upon for that statement, I would appreciate it.

22 A. I believe you will find that list  
23 within this document which is to be provided to you.

24 Q. All right. So essentially the  
25 documents you rely on for a contrary view to the last

1 paragraph on page 48 can be found in the document that  
2 is going to become exhibit --

3 MS. BLASTORAH: 764.

4 MR. CASTRILLI: Q. 764. Is that right,  
5 Mr. Kingsbury?

6 MR. KINGSBURY: A. That's correct.

7 Q. Mr. Kingsbury, if I could just  
8 continue -- sorry, if I could just ask you to turn to  
9 page 5 in this Exhibit 762.

10 The authors or the editors set out the  
11 exercise they went through at the top of the page.

12 "The reviews were essentially  
13 distillations of available literature  
14 with the exception that the song bird  
15 review also incorporated previously  
16 unpublished data and a re-analysis of  
17 earlier published information. Sources  
18 accessed included papers published in the  
19 primary literature as well as published  
20 and unpublished government reports. The  
21 literature examined was extensive but not  
22 exhaustive and a selection of only the  
23 most relevant material was made and there  
24 was no attempt to access proprietary  
25 information so as not to preclude release

1 of the final document to the public."

2 Now, what is going to become Exhibit 764,  
3 you say, is a report that you prepared which is freely  
4 available in the public literature?

5 A. That's correct.

6 Q. Were you contacted by these authors  
7 prior to their preparation of this report or during the  
8 course of it and asked to provide them with a list of  
9 what you had written in the field?

10 A. It was in fact, I believe on my own  
11 initiative was sent to, I believe it's Ms. White.  
12 Again, I would have to find the list of authors.

13 Q. Sorry, for that -- sorry. Which  
14 chapter are you referring to?

15 A. The song bird chapter.

16 Q. That's page 43. Bubsy, White, Pearce  
17 and Mineau.

18 A. That's right. I believe Ms. White  
19 was initially contracted to carry out the literature  
20 review and it is my recollection that I sent to Ms.  
21 White what I felt was a complete list of all reports on  
22 this topic authored by myself or the group that I was  
23 responsible for.

24 Q. That would include what will be  
25 Exhibit 764?



1                   A. And I specifically sent her a copy of  
2 this article. I would not make Ms. White totally  
3 responsible for what portions of the literature were in  
4 fact included in the final document because, from my  
5 understanding, she was not the senior or sole author of  
6 the final chapter.

7                   Mr. Castrilli, I might point out to the  
8 Board, you perhaps indicated some surprise that I might  
9 be saying that I'm using data that the authors  
10 themselves have collected which I find contradicts the  
11 statement they make.

12                  And, again, I recognize the Board does  
13 not have Table 3 of this chapter on page 91 which cites  
14 numbers of dead birds. I will, however, make reference  
15 to two things which can be supported with documents.

16                  This table and also a paper - and this  
17 may not be new to the Board - that in 1975 or '76, I'm  
18 not sure which and I have the paper here, there were  
19 reports which emanated from Dr. Pearce and his  
20 colleagues that indicated estimates that 6.5-million  
21 birds -- song birds had been killed by forestry spray  
22 programs in New Brunswick in that year.

23                  I would find the fact that in 1975 and  
24 1976 Mr. Pearce in this table which is part of the data  
25 he refers to of "not previously published data", he

1 actually gives numbers of birds found for those two  
2 years, 1975-76, and he lists 14 and 11 song birds found  
3 dead in fenitrothion spray areas in those two years.

4 Perhaps I'm -- you know, and I recognize  
5 that is not a full and complete statement - in fact,  
6 many of the spray casualties were associated with the  
7 use of phosphamidon, another material - but the fact is  
8 that fenitrothion was a large portion of that spray  
9 that Dr. Pearce attributed the death of hundreds of  
10 thousands of birds to fenitrothion spray regimes in  
11 those years, and yet some 14 or 15 years later he  
12 presents data which presumably he had in hand at that  
13 time which says that, in fact, he had 14 and 11 dead  
14 individuals that he can actually verify as being killed  
15 in those spray regimes.

16 Q. Mr. Kingsbury, we are continuing with  
17 page 8, the last four bulleted paragraphs. Could you  
18 just generally -- excuse me, the last three bulleted  
19 paragraphs, just generally advise the Board whether you  
20 agree or disagree with each of the paragraphs?

21 A. Okay. With respect to sub-lethal  
22 effects being biologically important, I believe my  
23 direct evidence would confirm that.

24 Q. So your answer is you agree with  
25 bulleted paragraph 5?

1                   A. That's correct. With the fact that  
2 most assessment techniques underestimate the impacts of  
3 forest spraying on song birds, I have some difficulties  
4 there.

5                   The Canadian Wildlife Service are  
6 responsible for migratory song birds and presumably are  
7 as capable as anyone in the country of assessing  
8 populations of those birds. The fact that their  
9 application of the best techniques they have cannot  
10 find population impacts related to fenitrothion sprays  
11 does not, to me, suggest that they are underestimating  
12 impacts; it may suggest that they are unable to find  
13 impacts.

14                  Basically this is a presumption that  
15 things may be worse than you can in fact demonstrate  
16 with the data that you are capable of collecting. I  
17 wouldn't argue that that may be the case, but it does  
18 not suggest that in fact it is the case. And the fact  
19 that -- in the final point it says:

20                  "Although laboratory studies have  
21 indicated captive birds are able to  
22 tolerate brain cholinesterase depressions  
23 of greater than 50%, such investigations  
24 are of limited value in predicting  
25 impacts in the wild, where birds..."

1       aren't subject to a whole bunch of factors, is a  
2       statement that I find difficult to accept, in that this  
3       document makes great use of laboratory studies on  
4       cholinesterase inhibition not only for fenitrothion,  
5       but on a range of other chemicals and then goes forward  
6       to base a lot of these conclusions on that data.

7                   Mr. Castrilli--

8                   Q.   Sorry --

9                   A.   --it may be helpful, given  
10       limitations of time, if I can point out, and although  
11       it's not my place to suggest, there is available to the  
12       Board a review of this entire document which has been  
13       prepared by Forestry Canada which presents detailed  
14       critique of the points you've asked me to comment on  
15       and, in fact, a great many points in this document, and  
16       it is a public document that is available to this  
17       Board.

18                   Q.   I presume, Mr. Kingsbury, your  
19       counsel will do that in re-examination. I'm content to  
20       leave it for then.

21                   I would like to ask you one last question  
22       in relation to Exhibit 762.

23                   THE CHAIRMAN: Well, just hold on second.

24                   MS. MURPHY: I take it to mean that my  
25       friend does not want that document in?

1 THE CHAIRMAN: I understand he doesn't  
2 want it in, but perhaps it would be valuable for the  
3 re-examination if it were distributed in advance, if  
4 you are in fact going to produce it, so that questions  
5 during re-examination can be meaningful in the light of  
6 people having read the document.

7 MR. CASTRILLI: Well, if Ms. Murphy is  
8 making the offer, I would like to have it before I  
9 finish my cross-examination.

10 THE CHAIRMAN: Well...

11 MS. MURPHY: No problem with that. If I  
12 can get enough copies, certainly.

13 THE CHAIRMAN: Well, we don't want to be  
14 met in re-examination with the fact that nobody has  
15 seen the document at that point.

16 MS. MURPHY: That's fine, there's no  
17 difficulty with having access to it.

18 THE CHAIRMAN: And that's precisely, Mr.  
19 Castrilli, some of the difficulties that we have  
20 encountered to this point in your cross-examination as  
21 well.

22 MR. CASTRILLI: I'm sorry, Mr. Chairman?

23 THE CHAIRMAN: I said that's precisely  
24 some of the difficulties that we have encountered in  
25 your cross-examination to this point as well, not



1 having the documentation distributed in advance to give  
2 the parties an opportunity to see it.

3 MR. CASTRILLI: Mr. Chairman, I have made  
4 every effort to make these documents available to Ms.  
5 Murphy now almost up to a week in advance, so I don't  
6 quite understand the suggestion that I haven't been  
7 doing that.

8 THE CHAIRMAN: No, I'm just making the  
9 suggestion with respect to documents where they are  
10 incomplete, yet we end up referring to the complete  
11 document.

12 MR. CASTRILLI: I just don't happen to  
13 have inexhaustive resources to reproduce in their  
14 entirety every document I refer to.

15 Q. Mr. Kingsbury, just so I understand  
16 the situation federally, can you agree with me that  
17 Forestry Canada also agreed to the re-evaluation of  
18 fenitrothion as a a result of this report?

19 MR. KINGSBURY: A. The re-evaluation  
20 would have been something that Agriculture Canada  
21 requested its advisory agencies to do. Forestry Canada  
22 has agreed to participate in that re-evaluation.

23 Q. My understanding is that Agriculture  
24 Canada and its environmental and forestry advisors,  
25 which would include Forestry Canada, have agreed to

1       this review; isn't that true?

2                   MS. MURPHY:  If this is the previous  
3       exhibit that you're reading from that you haven't given  
4       him a copy of, why don't you just give him a copy of  
5       it.

6                   MR. CASTRILLI:  I don't have a copy of it  
7       and he can confirm it once he has the document, but  
8       that's my understanding.

9                   Q.  I just want to know whether it is in  
10      fact your understanding, Mr. Kingsbury?

11                  MR. KINGSBURY:  A.  Forestry Canada has  
12      agreed to Agriculture Canada's request to review the  
13      database.  It's is quite simple, Mr. Castrilli.  I  
14      think --

15                  Q.  That's fine.  Page 95.

16                  A.  Yes.

17                  Q.  The last -- really the last full  
18      paragraph in the document, the third line down  
19      beginning after the comma:  "...there are...",

20                         "...there are serious doubts about the  
21                         desirability of such insecticide being  
22                         in the arsenal of products available for  
23                         broad-scale forest spraying."

24                         Do you agree with that assessment?

25                         A.  No, I would not agree with it at all.

1 Q. So the authors have got it wrong?

2 MS. MURPHY: I think he's answered that  
3 question.

4 THE CHAIRMAN: Basically he says he  
5 doesn't agree with it at all. So presumably if they  
6 are taking a contrary view...

7 MR. CASTRILLI: Q. The last sentence in  
8 the paragraph:

9 "Now is an appropriate time to reassess  
10 the role that fenitrothion will play  
11 in forest protection and to turn  
12 collective attention away from that  
13 insecticide to more promising  
14 alternatives."

15 Do you agree with that assessment?

16 MR. KINGSBURY: A. Mr. Castrilli, I  
17 would point out that Forestry Canada's position, and it  
18 is perhaps demonstrated by their track record, has been  
19 to constantly attempt to make available to forest  
20 managers in Canada the most effective environmentally  
21 innocuous pest control products that they can. In  
22 doing that, they recognize that there is a need for a  
23 range of products to address a range of situations.

24 I guess in saying that what I am saying  
25 is that it is always an appropriate time to seek to

1 provide to forest managers whatever might be the most  
2 promising alternatives to deal with pest problems.

3 I feel that the suggestion that now is  
4 the time to reassess the role of fenitrothion is  
5 perhaps a totally inappropriate statement, in that I  
6 would suggest to you that the current and potential  
7 future use pattern of fenitrothion into the foreseeable  
8 future is likely to be a very tiny percentage of the  
9 past use pattern, that in fact right now the use of  
10 this material is very limited compared to what it used  
11 to be and you will find, in my document, evidence of  
12 that.

13 I guess to me one of the critical points  
14 about this document is that at the very beginning, in  
15 the preamble on page 4, the authors state:

16 "There is now a critical mass of data and  
17 a gathering perception that fenitrothion  
18 in forest spray use patterns causes  
19 impacts that should be questioned,  
20 particularly in light of society's  
21 increased concern for environmental  
22 health."

23 And if I might just cite from Forestry  
24 Canada's critique of this document, they state that:

25 "The statement that there is now a

1 critical mass of data and a gathering  
2 perception that fenitrothion in forest  
3 spray use patterns causes impacts is  
4 somewhat misleading. In fact, only a  
5 small amount of new information has been  
6 generated in the last ten years,  
7 especially in regard to pollinators."

8 And I would agree with those statements  
9 wholeheartedly and also indicate to you that, to the  
10 best of my knowledge, the research team that I directed  
11 up until last year was the only team that generated new  
12 data on the impact of forestry use of fenitrothion on  
13 pollinators since early in the 1980s.

14 "Reference to this information..."

15 Going on to cite it:

16 "...as a critical mass of data is not  
17 appropriate. The comment on gathering  
18 perceptions may be true, but these are  
19 perceptions on whose part; i.e., the  
20 public, pesticide regulators, pesticide  
21 evaluators, federal or provincial  
22 environment departments. Not all groups  
23 necessarily share this perception. In  
24 addition, although perception may be  
25 important, regulatory and environmental



1 decisions and recommendations should be  
2 formed on scientific as opposed to  
3 perceptual bases."

4 Q. Is it your understanding -- or is it  
5 your testimony that this report is not based on  
6 scientific perceptions?

7 A. It is my testimony that many of the  
8 conclusions drawn in this report do not reflect my  
9 evaluation of the scientific data available.

10 MS. BLASTORAH: Mr. Chairman, perhaps we  
11 should get the page reference and give that document an  
12 exhibit number so that it will be clear on the record.

13 THE CHAIRMAN: Do you have any  
14 objections, Mr. Castrilli, to doing it at this point?

15 MR. CASTRILLI: No.

16 THE CHAIRMAN: Exhibit 765.

17 MR. CASTRILLI: Mr. Kingsbury, can you  
18 identify the document by name?

19 MR. KINGSBURY: The name of the document  
20 is: A Review of the Environment Canada Atlantic Region  
21 Document (Environmental Effects of Fenitrothion Use in  
22 Forestry Impacts on Insect Pollinators, Songbirds and  
23 Aquatic Organisms) i.e., the document we have  
24 identified as...

25 MR. CASTRILLI: Exhibit 762.

1 MR. KINGSBURY: 762.

2 MR. CASTRILLI: The date of the review?

3 MR. KINGSBURY: Is reviewed by Forestry  
4 Canada. I can't see a date up front, but it was  
5 obviously produced subsequent to the other document  
6 which is dated March, 1989.

7 I would point out that there was in fact  
8 a review prior to the finalization of this document  
9 that was submitted to the editors of this document.

10 MS. MURPHY: We will attempt to find out  
11 if there was a date that can be attached to that  
12 document, Mr. Chairman.

13

14 ---EXHIBIT NO. 765: Document entitled: A Review of  
15 the Environment Canada  
16 Atlantic Region Document  
17 (Environmental Effects of  
Fenitrothion Use in Forestry  
Impacts on Insect Pollinators,  
Songbirds and Aquatic Organisms).

18 MR. CASTRILLI: Mr. Kingsbury, you  
19 mentioned in your last comment, you said that there was  
20 a version of Exhibit 765 provided to the authors of the  
21 Environment Canada Report prior to the release of their  
22 report?

23 MR. KINGSBURY: A. Some of the data  
24 in -- some of the comments in 765 were in fact comments  
25 on draft -- a draft manuscript of the Environment

1 Canada Report, that's correct.

2 Q. And that was made available to the  
3 Environment Canada authors before they issued the final  
4 report?

5 A. That is my understanding, yes.

6 Q. Is it in fact a separate document now  
7 or did it really become what is now Exhibit 765?

8 A. 765 is in fact something more than  
9 those original comments on the draft, and they include  
10 with them summary comments by Forestry Canada that  
11 would represent the position of Forestry Canada with  
12 respect to this document and the issue that it deals  
13 with.

14 MR. CASTRILLI: Mr. Chairman, I don't  
15 recall the last time we had a break. Have we had one  
16 in the last two hours?

17 THE CHAIRMAN: No, but we are going to  
18 have one now.

19 MS. BLASTORAH: Mr. Chairman, just before  
20 we break perhaps we can get the page reference. I  
21 think we kind of got sidetracked from that.

22 MR. KINGSBURY: Yes, I'm sorry. The  
23 section that I read directly and agreed with was from  
24 page 1 of Chapter 1, the Overview.

25 THE CHAIRMAN: Mr. Castrilli, can you

1 give us any indication of where we are?

2 MR. CASTRILLI: Mr. Chairman, I would say  
3 that we're probably capable of finishing within the  
4 next couple of hours. That would probably take us to  
5 too late today, but if the Board --

6 THE CHAIRMAN: All right. Why don't we  
7 go for another hour after the break.

8 MR. CASTRILLI: I think that would be a  
9 good idea and I may well --

10 THE CHAIRMAN: And pick it up the first  
11 hour tomorrow.

12 MR. CASTRILLI: Yes, that would be fine.  
13 Thank you.

14 THE CHAIRMAN: Okay, 15 minutes.

15 ---Recess taken at 5:05 p.m.

16 ---On resuming at 5:23 p.m.

17 THE CHAIRMAN: Thank you. Be seated,  
18 please.

19 MS. BLASTORAH: Mr. Chairman, just before  
20 we get back into Mr. Castrilli's cross-examination, I  
21 now have copies of the two documents Dr. Ritter  
22 referred to earlier this afternoon which he was  
23 providing in response to an undertaking. So I would  
24 ask that those be marked as exhibits at this time.

25 THE CHAIRMAN: Okay. The first one will

1 be...

2 MS. BLASTORAH: The first one will be a  
3 research report titled: A Four-Week Oral Toxicity  
4 Study of 2,4-D Amine Salt in the Albino Rat, and that  
5 is by J.M. Morgan, et al. A report prepared for Health  
6 and Welfare Canada, Health Protection Branch by  
7 Bio-Research Laboratories, Ltd., and the cover package  
8 of the document indicates that it is project No. 82373,  
9 dated June 20th, 1986.

10 THE CHAIRMAN: Exhibit 766.

11 MS. BLASTORAH: And what I have is a  
12 front page of the report plus two attached pages which  
13 is the summary of that document.

14 ---EXHIBIT NO. 766: Excerpt of research report  
15 entitled: A 4-Week Oral Toxicity  
16 Study of 2,4-D Amine Salt In The  
17 Albino Rat, authored by J.M.  
Morgan, et al, dated June, 20th,  
1986.

18 MS. BLASTORAH: Sorry, Mr. Chairman, what  
19 was the exhibit number?

20 THE CHAIRMAN: 766.

21 MS. BLASTORAH: Thank you. The next one  
22 is an article entitled: Organohalogen Residues in  
23 Human Adipose Autopsy Samples from Six Ontario  
24 Municipalities by David T. Williams, et al.

25 And I believe this is the correct cite,



1 Mr. Ritter -- or Dr. Ritter, perhaps you could correct  
2 me if I'm wrong. It is contained in the Journal of  
3 Associated -- no.

4 DR. RITTER: The Journal of the  
5 Association of Official Analytical Chemists.

6 MS. BLASTORAH: Thank you.

7 THE CHAIRMAN: I think lawyers in general  
8 can hold their heads high after this last session with  
9 scientists in terms of title and words and...

10 MS. BLASTORAH: And just for the record  
11 that's Volume 71, No. 2, dated 1988.

12 Thank you, Mr. Chairman.

13 THE CHAIRMAN: Thank you.

14

15 ---EXHIBIT NO. 767: Article entitled: Organohalogen  
16 Residues in Human Adipose Autopsy  
17 Samples from Six Ontario  
18 Municipalities by David T.  
Williams, et al, Vol. 71, No. 2,  
dated, 1988.

19 MR. CASTRILLI: Q. Dr. Ritter, if I  
20 could continue with you. Just for my information,  
21 Exhibit 716, the Crump article, it is described as a  
22 worst-case analysis. The part dealing with cancer  
23 risks in that report, would that also be a quantitative  
24 risk assessment?

25 DR. RITTER: A. Yes, it is. The

1 analysis is based on a multi-stage linearized analysis  
2 of cancer risk.

3 A multi-stage linearized analysis is  
4 considered -- it's a 95 per cent confidence limit. I  
5 don't know if there's any point in pursuing the  
6 statistical significance of that model or not, but let  
7 me just say that it's considered by many authorities to  
8 be a worst-case estimate in the statistical context;  
9 that is, it tends to overestimate rather than  
10 underestimate projected risks.

11 Q. Sorry. Can you confirm for me, Dr.  
12 Ritter, that the policy of Health and Welfare Canada,  
13 and I guess this would include the Health Protection  
14 Branch, in the determination of risk from potentially  
15 carcinogenic substances is to use a weight of evidence  
16 approach to the data?

17 A. I can't really tell you what the  
18 policy is, Mr. Castrilli, as far as the Health  
19 Protection Branch is concerned because I don't know  
20 that we have an entrenched policy.

21 It's the practice of the Health  
22 Protection Branch to include a weight of evidence  
23 approach in its analysis of data, but not necessarily  
24 restrict itself to any given method and, in that  
25 context, we use an overall weight of evidence approach,

1 if you like. That is, we tend to make use of all  
2 available models and analyses in arriving at a  
3 conclusion and certainly have periodically made use of  
4 statistical models to estimate risk as well.

5 Q. Is it the policy of the Health  
6 Protection Branch not to use quantitative risk  
7 assessment in the determination of carcinogenic risk?

8 A. Well, again, it's not really a matter  
9 of policy so much as it is a matter of practice. I'm  
10 not aware of a written policy within the archives of  
11 the Health Protection Branch which says that we may or  
12 may not estimate risk by any given method.

13 The approach taken generally by the  
14 Health Protection Branch, particularly in the last  
15 couple of years, is to avail itself of all technology  
16 available to estimate cancer risks and that may include  
17 biological weight of evidence, it may include  
18 mathematical models and frequently includes all  
19 available information.

20 Q. Can you confirm for me, Dr. Ritter,  
21 that the Alachlor Review Board confirmed the use of the  
22 weight of evidence approach used by the Health  
23 Protection Branch as preferable to quantitative risk  
24 assessment?

25 A. Yes, they did.

1 Q. Dr. Ritter, I would like to return  
2 you to Exhibit 603A.

3 A. Yes.

4 Q. It is page 97 of your evidence.

5 A. Yes.

6 Q. Sorry, we are looking at the  
7 conclusions on that page, and you note that:

8 "The Canadian regulatory requirements are  
9 considered among the strictest in the  
10 world. Because of the extensive data  
11 requirements for modern pesticide  
12 registration in the stringent regulatory  
13 reviews to which they are subjected,  
14 there is good reason to have confidence  
15 that the pesticides available for use  
16 today, if used appropriately, should not  
17 pose an unacceptable risk to the user,  
18 the bystander or the environment."

19 I understand as part of that -- part of  
20 the government regulatory program is the process of  
21 re-evaluation?

22 A. That's correct.

23 Q. And that's re-evaluation of already  
24 registered pesticides; is that right?

25 A. That's correct.

1                   Q. And I note that in your evidence you  
2 also refer to the fact that registered products are  
3 subject to re-evaluation in the light of new  
4 information during the life of the product?

5                   A. That's correct.

6                   Q. And I understand that re-evaluation  
7 is a long and complex procedure which frequently  
8 involves the generation of new data; is that right?

9                   A. Yes.

10                  Q. Is the lengthy nature of the  
11 re-evaluation process a cause for concern in relation  
12 to older products, those that might have been first  
13 registered decades ago?

14                  A. I'm not sure I quite understand your  
15 question in the context of a cause for concern. Are  
16 you asking: Would it be preferable to do it faster?

17                  Q. Yes.

18                  A. Yes. It would be ideal if we could  
19 re-evaluate all 6,000 registered products -- all 5,000  
20 registered products every year.

21                  Q. But that doesn't happen; is that  
22 right?

23                  A. Precisely. But I am trying to  
24 understand your question. It would be preferable to  
25 do it faster, absolutely.



1 Q. Can you confirm that the Auditor  
2 General of Canada concluded in 1988 that although the  
3 federal government has recently begun to systematically  
4 re-evaluate pesticide products, that at the present  
5 rate of re-evaluation it will take decades to complete?

6 A. I have the document I think from  
7 which you're reading, but I can't find the sentence in  
8 particular.

9 MR. CASTRILLI: Mr. Chairman, it  
10 obviously is incumbent upon me to introduce the  
11 document, and I have the entirety of the document.

12 It is the Report of the Auditor General  
13 of Canada to the House of Commons for the fiscal year  
14 ended March 31, 1988.

15 And having said I have the entirety of  
16 the document, let me now say that I have the entirety  
17 of the document as it relates to the Department of  
18 Agriculture and the Pest Control Products Act.

19 THE CHAIRMAN: That should suffice for  
20 the purposes of this hearing. Exhibit 768.

21 ---EXHIBIT NO. 768: Report of the Auditor General of  
22 Canada to the House of Commons for  
23 the fiscal year ended March 31,  
24 1988 re: Department of  
Agriculture and Pest Control  
Products Act.

25 MR. CASTRILLI: Q. And, Dr. Ritter, you

1 have a copy?

2 DR. RITTER: A. Yes, I do.

3 MR. CASTRILLI: (handed)

4 THE CHAIRMAN: Thank you.

5 MR. CASTRILLI: Mr. Chairman, that was  
6 Exhibit 768?

7 THE CHAIRMAN: That's correct.

8 MR. CASTRILLI: Q. Dr. Ritter, this  
9 document doesn't have page numbers, it has numerical  
10 headings, so we will have to do this by the numerical  
11 headings.

12 DR. RITTER: A. I think I have now found  
13 the paragraph, if it would assist you, to which you  
14 were referring a moment ago. Paragraph 8.54 on what is  
15 page -- the third page of this document.

16 Q. Yes, that's right. Sorry, it would  
17 be the second full page not including the title page or  
18 the cover page.

19 THE CHAIRMAN: Why don't we just number  
20 the pages.

21 MR. CASTRILLI: Number the pages?

22 THE CHAIRMAN: Yes.

23 MR. CASTRILLI: All right. So the first  
24 page would be the page that begins: The Department of  
25 Agriculture.

1 Q. Dr. Ritter, without dwelling on the  
2 range of years that the Auditor General outlined, would  
3 you agree generally that the length of time  
4 re-evaluation is expected to take in relation to older  
5 pesticides is a cause for concern?

6 DR. RITTER: A. Mr. Castrilli, insofar  
7 as the Auditor General's Report cites a number, I can  
8 perhaps discuss that with you, but the report that you  
9 are referring to is an audit of a program administered  
10 by the Department of Agriculture, not the Department of  
11 Health and, as a representative of the Department of  
12 Health, I don't know if I can materially assist you in  
13 commenting on an audit of a department of which I'm not  
14 a member.

15 Q. All right. Well, actually, I'm only  
16 obviously interested in that part of the exercise that  
17 has to do with re -- well, from your perspective,  
18 re-valuation in relation to health, and I'm wondering  
19 if you can just help me -- perhaps we can just shorten  
20 this up.

21 A. Can I just interrupt you there. We  
22 did not contribute to the Auditor General's Report in  
23 this context, so that if your interest relates to the  
24 activities which we maintain with regards to  
25 reevaluation of older products, then you -- they are

1 not necessarily the same, that is what I'm trying to  
2 say.

3 Q. But you would agree this audit deals  
4 with the environmental and human health risks  
5 associated with pesticides or talks about that, so  
6 obviously to that extent it must be talking about the  
7 role of Health and Welfare Canada in that process; is  
8 it not?

9 A. Well, rather than belabour it,  
10 perhaps if you would like to ask your question I will  
11 endeavor to answer it.

12 Q. All right.

13 MR. CASTRILLI: Perhaps, Mr. Chairman, it  
14 might be easiest to simply do this by taking some  
15 numbers that I understand are the current numbers for  
16 active ingredients in Canada.

17 Q. Would that number be approximately  
18 450?

19 DR. RITTER: A. Yes.

20 Q. And I think you indicated earlier  
21 there are approximately 5,000 products?

22 A. Approximately that is the order.

23 Q. All right. How many of the active --  
24 and the re-evaluation exercise is in relation to the  
25 active ingredients; is that right?

1                   A. That's correct.

2                   Q. How many active ingredients have ever  
3 been re-evaluated by Health and Welfare Canada even  
4 once?

5                   A. A much larger number than the number  
6 re-evaluated by Agriculture Canada. That was the point  
7 I was trying to make.

8                   We do not have statutory authority for  
9 administration of the re-evaluation program which was  
10 the subject of this audit by the Auditor General. We  
11 do, however, have the initiative to carry out ad hoc  
12 re-evaluations, as I indicated during my formal  
13 comments, where we feel that they are indicated. And,  
14 to that extent, we have carried out many, many more  
15 than have been formally sanctioned as re-evaluations by  
16 the Department of Agriculture.

17                   One example that comes to mind is the one  
18 that you just illustrated with a moment ago and that is  
19 alachlor. Although alachlor was cancelled for use in  
20 Canada in 1985 it was, technically speaking, never  
21 subjected to formal re-evaluation. So I would think  
22 that that activity on our part speaks well to the fact  
23 that we need not await the announcement of a formal  
24 re-evaluation to initiate a re-evaluation of  
25 health-related data.



1 Q. Okay. Well, are we talking about two  
2 definitions of re-evaluation here?

3 A. No. You are talking about a lawful  
4 definition for a statute which we don't administer, and  
5 we are talking about an operational definition for an  
6 interest in health and safety concerns regarding  
7 pesticides in which we have an interest.

8 Fortunately or unfortunately, the same  
9 word is often used to describe both activities. So  
10 that again, as in the case of alachlor, and there are  
11 others, I could illustrate with nitrofin, with  
12 plicotrin, with dinacet, with dinacap.

13 I can go on and on and on, but the point  
14 that I'm trying to make is that we will take this  
15 initiative where we feel that it's appropriate whether  
16 or not a formal re-evaluation pursuant to the  
17 regulations of the Act has been announced by the  
18 Minister of Agriculture.

19 Q. Using your definition of  
20 re-evaluation of whatever that might be, but your  
21 definition as you use it within the Health Protection  
22 Branch, how many re-evaluations have been done by  
23 Health and Welfare? I mean that in the sense of how  
24 many products have been re-evaluated.

25 A. I will relate that to active

1 ingredients--

2 Q. Yes, how many active ingredients.

3 A. --which is reflective of your  
4 question. There are formal re-evaluations that are  
5 pending at this time on atrazine, on the chlorophenoxy/  
6 chlorophenol-type products and that whole family, and I  
7 can't tell you off the top of my head how many that  
8 chlorophenol/chlorophenoxy-type re-evaluation  
9 encompasses. Those are formal re-evaluations and I  
10 think there may be 15 active ingredients in that.

11 And there are formal re-evaluations  
12 underway on the fumigants which also may represent,  
13 I'll say, 10 products.

14 Now, in addition to that, over the last  
15 few years within relatively recent history, I would say  
16 that we have initiated ad hoc re-evaluations at one  
17 level or another on perhaps 25 others. That number  
18 might be 18 - I'm trying to give you a sense - it might  
19 be 33. I think what I'm trying to say is that it's not  
20 4 and it's not 100, but without actually checking a log  
21 it would be difficult for me to verify for you with  
22 absolute precision that activity over the last four or  
23 five years. I think it's about -- I think if I answer  
24 by saying approximately 25, I'm going to be  
25 approximately correct.

1 Q. Can I ask you -- sorry, the 25 --  
2 there are 25 ongoing; is that right, roughly? I don't  
3 want to nail you down to a number if you don't feel  
4 comfortable with being locked into a particular number?

5 A. Yes, yes.

6 Q. But it's roughly in that order of  
7 magnitude?

8 A. That's correct.

9 Q. Okay. And that is something that  
10 could be begun and completed in one year? How many  
11 re-evaluations, as you define them, can you do in one  
12 year?

13 A. Well, that depends on the extent of  
14 data which is required and the extent of questions that  
15 may be generated as a result of the reviews of newly  
16 submitted studies.

17 THE CHAIRMAN: Mr. Castrilli, is the  
18 point of this to try and determine how long it might  
19 reasonably take to conduct a re-evaluation of all of  
20 the active ingredients that have been identified and/or  
21 all of the products in which those active ingredients  
22 might be used to get a sense of how many years it might  
23 take to go through the complete program. Is that where  
24 we are going?

25 MR. CASTRILLI: That's essentially...

1                   THE CHAIRMAN: Okay. Why don't we just  
2 put that question to Dr. Ritter in terms of ballpark  
3 figures.

4                   The Auditor General has, for whatever  
5 reason, under the formal process with Agriculture  
6 Canada indicated maybe 37 to 55 years.

7                   Given the fact that Health and -- the  
8 Health Protection Branch initiates its own ad hoc  
9 investigations or re-evaluations whenever it is  
10 concerned, how long, if you can estimate roughly, do  
11 you think it would take to go through the number of  
12 active ingredients out there in terms of the number of  
13 products that are currently on the market, if you can  
14 do a rough calculation?

15                  DR. RITTER: I can do a rough  
16 calculation. I would like to qualify just very  
17 briefly, if I can, before answering.

18                  The criteria which are used to select  
19 pesticides for re-evaluation, as I discussed earlier,  
20 are based on a number of principles which include age  
21 of data, and extent of use. Now, there are many  
22 pesticide products within that list of 450 active  
23 ingredients which, for all practical purposes, have  
24 very limited or virtually non-existent uses. So  
25 that -- in addition to that, there are pesticides for

1       which the uses may be in an area or in a context in  
2       which they are not expected to constitute a concern at  
3       one level or another, be they public health or  
4       environment or what have you.

5                       So that the actual number of pesticides  
6       which may create concern would be far fewer than 450.

7                       THE CHAIRMAN:   Okay.   What would that  
8       number be roughly?

9                       DR. RITTER:   Well, we published a  
10       document, for example, on criteria used - and again I  
11       can make that available, that's in press as well - on  
12       criteria used to select chemicals for consideration by  
13       the Working Group on Drinking Water and it is exactly  
14       those criteria which are used by the Working Group and  
15       it's probably of the order of perhaps a quarter to a  
16       third of the total number of active ingredients  
17       registered which are considered to represent some  
18       interest in terms of a re-evaluation program.

19                      THE CHAIRMAN:   So what's that, 150 or so?

20                      DR. RITTER:   Let's say somewhere in that  
21       order.   Now, if we were to do, including ad hoc and  
22       formal, somewhere in the order perhaps of maybe 10 of  
23       these kinds of things a year, then I would expect that  
24       might take 15 years or so to go through one complete  
25       loop.



1 THE CHAIRMAN: Okay. And you can take  
2 the questioning from there, Mr. Castrilli.

3 MR. CASTRILLI: That's fine.

4 Q. I just wanted to get a sense from Dr.  
5 Ritter whether the numbers that appear in what is  
6 paragraph 8.54 in his view reflect the situation within  
7 his branch or division.

8 DR. RITTER: A. Both. They do, they are  
9 accurate as far as the formal re-evaluation program is  
10 concerned, but the reason that I added the  
11 qualification that I did is because this is an audit of  
12 the total number of active ingredients registered  
13 without regard to whether or not all of them should  
14 really be subjected to formal re-evaluation; that is,  
15 it's simply a comparison of the time required to do one  
16 and the total number available to do without any input  
17 whatsoever on the ones you actually should do, and that  
18 list is much smaller.

19 In fact, as the Auditor General's Report  
20 indicates, they say that:

21 "Whereas it would take 37 to 55 years to  
22 complete the full cycle, it would take 15  
23 to complete the ones of priority."

24 Q. So the 15 years relates to roughly  
25 the 150 figure you just gave the Chairman; is that

1 right?

2 A. It's the same figure. I would think  
3 it's probably based on the same sort of analysis by the  
4 Auditor General, yes.

5 Q. And of those 150, can we assume that  
6 the nine that are the subject matter of this part of  
7 the hearing would be included?

8 A. The phenoxy herbicides, for example,  
9 are included, as I indicated the other day.

10 Q. And just -- sorry. You, I think, now  
11 remember the other eight products, the phenoxy  
12 herbicides is really only 2,4-D for the purposes of  
13 this hearing.

14 A. Yes.

15 Q. What about the other eight, are they  
16 included in the 150 that might get reviewed or  
17 re-evaluated in the next 15 years?

18 A. No, I would attach very limited  
19 priority to a number of the chemicals which are on that  
20 list. For example glyphosate, as we have discussed in  
21 a variety of cross-examination, contains what is, in my  
22 view, a very recent, very contemporary database and I  
23 would have to attach a relatively low ranking to the  
24 need to re-evaluate glyphosate because there are not  
25 very many products that are supported by more

1 contemporary databases than is glyphosate.

2 And if we went through the list in a  
3 similar way of all the chemicals, there are varying  
4 degrees of completeness of the data for all of these.  
5 I would say glyphosate is very good and there are  
6 others that are less good. I would probably put  
7 glyphosate near the top of the list of very good, if  
8 you like.

9 Q. The next -- I am sorry, page 2 of the  
10 Exhibit 768 we are looking at -- sorry, we are on that  
11 page, paragraph 8.51.

12 The Auditor General concludes that:

13 "The Federal Pesticide Program needs to  
14 Strengthen the current procedures for  
15 Registering and regulating pesticides to  
16 have a basis for providing reasonable  
17 assurance that all pesticide products  
18 used in Canada pose minimal or no risk to  
19 human health..."

20 And it goes on to say:

21 "...and the environment."

22 I won't ask you to comment on the "and  
23 environment", part. Do you agree with the Auditor  
24 General's assessment as it relates to human health?

25 A. Again, Mr. Castrilli, that is taking

1 it somewhat out of context. The advice which is being  
2 given by the Auditor General although relates to human  
3 health, refers specifically to the regulation of  
4 pesticides for which the Department of Health and  
5 Welfare does not have statutory authority.

6 What you are asking me is to comment on  
7 whether or not I think the Department of Agriculture  
8 should be doing more with regards to human health, and  
9 I really don't have an opinion on that.

10 Q. But, Dr. Ritter, just so I understand  
11 your evidence, somewhere in Exhibit 709 there is the  
12 chart you produced.

13 A. Yes.

14 Q. Which, as I recall, outlined the  
15 various federal departmental responsibilities in  
16 relation to the pesticide process in Canada?

17 A. That's correct.

18 Q. Can you confirm for me that the only  
19 agency that has any expertise at the federal level is  
20 your branch?

21 A. But this comment is not directed at  
22 our branch, that is the point I'm trying to make, Mr.  
23 Cascade. It's directed at the agency charged in Canada  
24 under law to administer this Act which is not the  
25 Department of Health and Welfare.

1 THE CHAIRMAN: 709A; isn't it?

2 DR. RITTER: Yes.

3 MR. CASTRILLI: Yes, that's right.

4 DR. RITTER: So I don't know what more I  
5 can say. This is not an audit of a program within the  
6 Department of Health and Welfare. This statement does  
7 not say that we should be doing more to strengthen our  
8 program, it in no way reflects on the quality of our  
9 program.

10 THE CHAIRMAN: So is what you are saying  
11 effectively, Dr. Ritter, that the Auditor General has  
12 not evaluated the efficacy of the entire registration  
13 program?

14 DR. RITTER: That's correct.

15 THE CHAIRMAN: Which would include your  
16 branch, Environment, Fisheries and Oceans, Agriculture,  
17 et cetera?

18 DR. RITTER: That's correct. That's  
19 correct.

20 THE CHAIRMAN: He is solely looking at  
21 Agriculture and their program and their part in the  
22 overall program?

23 DR. RITTER: That's correct, as they have  
24 responsibility for administering the overall program,  
25 the audit speaks to that overall administration, but



1 it's not an audit of the Health and Welfare component  
2 of that program.

3 THE CHAIRMAN: Or any of the other  
4 components?

5 DR. RITTER: Or any of the other  
6 components, to the best of my knowledge.

7 THE CHAIRMAN: Other than Agriculture?

8 DR. RITTER: That's correct.

9 THE CHAIRMAN: And that is your  
10 understanding of what his report means?

11 DR. RITTER: That's right.

12 MR. CASTRILLI: Mr. Chairman, I'm not  
13 trying to be obtuse about this.

14 Q. The relationship under the Pest  
15 Control Products Act is one of cooperation between the  
16 Department of Agriculture who -- or the Department of  
17 Agriculture which is formally responsible for this  
18 statute and the various departments you outlined in  
19 Exhibit 709; is that right?

20 DR. RITTER: A. Yes. In fact formally  
21 entrenched in an agreement between the Minister of  
22 Health and the Minister of Agriculture.

23 Q. Yes, I'm familiar with that. Can you  
24 advise the Board: There is no expertise within  
25 Agriculture Canada that reproduces the expertise in

1       your branch; is that right?

2                   A.   That's right.

3                   Q.   So that any health assessments  
4       emanating from the Government of Canada with respect to  
5       pesticides could only come from your branch; is that  
6       right?

7                   A.   No.   Mr. Castrilli, the question that  
8       you are asking, by way of example, is sort of analogous  
9       to what happened with the tuna affair some years ago  
10      where one department has responsibility for the quality  
11      assurance of the product but another department has  
12      responsibility for its enforcement.

13                   The Department of Health and Welfare, in  
14      that case, was responsible for assessing the various  
15      quality parameters associated with food products, but  
16      it was the Department of Fisheries that would  
17      ultimately seize a shipment of tuna, for example.

18                   The Department of Agriculture could,  
19      under its statutory authority, do all kinds of things  
20      if it chose to.   The fact that it has no resident  
21      expertise is why we exist and why our input can be  
22      formally requested pursuant to that agreement which I  
23      referenced, but I still don't take this statement to be  
24      an audit of our program.

25                   But rather than argue it, Mr. Castrilli,

1 let me say that we, as a department, without regard to  
2 what the Department of Agriculture have done, have  
3 implemented a number of things in the last couple of  
4 years which we feel will go to some measure to  
5 strengthen our responsibility in the area of pesticide  
6 regulation and that includes some of the field  
7 monitoring studies for both residues and other possible  
8 effects; it includes the Canadian Farm Operator  
9 Mortality Study, and very noticeably includes the ad  
10 hoc re-evaluations of significant products which we  
11 initiated within the federal network.

12 We were the first to undertake these  
13 informal, if you like, ad hoc re-evaluations. So that  
14 I think the record over the last four or five years, as  
15 far as the Health Protection Branch is concerned, has  
16 been rather progressive in the area of trying to  
17 strengthen our component of the program. But I can't  
18 emphasize too strongly that, at least in my view, this  
19 statement is not an audit of programs administered by  
20 the Health Protection Branch but directed to the  
21 Minister of Agriculture of which I'm not a member of  
22 staff.

23 Q. Section 8.53.

24 MS. CRONK: Sorry, Mr. Chairman. Before  
25 my friend moves on, could you read onto the record the

1 completion of paragraph 8.51, please.

2 MR. CASTRILLI: Sorry.

3 MS. CRONK: Could you read the last  
4 sentence in paragraph 8.51. You chose to stop instead  
5 of reading the whole paragraph.

6 MR. CASTRILLI: Well, Mr. Chairman, my  
7 friend could have introduced this document if she  
8 wanted to and asked the witness to read that sentence  
9 in if she liked. She didn't choose to do that.

10 MS. CRONK: Sir, I have an absolute right  
11 if a part of a paragraph is read into the record to  
12 ask, as you would with even informal proceedings or  
13 discovery transcripts, that the balance be read.  
14 However, it's late, not much turns on it.

15 If my friend is going to involve us in a  
16 lengthy objection I'll withdraw it, but I have absolute  
17 right under jurisprudence.

18 MR. CASTRILLI: Mr. Chairman, the  
19 document is part of the evidence, it's now an exhibit.  
20 It doesn't need to be read into the record separately.

21 THE CHAIRMAN: Well, why don't we deal  
22 with it on the basis that the Board will take notice of  
23 the last sentence.

24 MS. CRONK: Thank you, sir.

25 THE CHAIRMAN: And that's probably

1 sufficient for the purpose of this proceeding.

2 MS. CRONK: Thank you, sir.

3 MR. CASTRILLI: Q. Dr. Ritter, in  
4 section 8.53--

5 DR. RITTER: A. Yes.

6 Q. --the Auditor General indicated:

7 "There is a need to re-evaluate many  
8 products. Many were registered prior to  
9 1980 and were not given the same scrutiny  
10 that is now required."

11 Do you agree with that statement?

12 A. Yes. That, Mr. Castrilli, as we have  
13 discussed on several occasions, is the driving force  
14 behind both the formal and informal re-evaluation  
15 programs.

16 Our collective recognition that  
17 pesticides that have not been registered in the last  
18 eight or nine or ten years, as I indicated during my  
19 formal comments, have in all likelihood not been  
20 subjected to the rigor that these data requirements  
21 entail.

22 That is simply a statement of what I have  
23 already told you several times.

24 Q. The paragraph goes on, Dr. Ritter.  
25 The Auditor General notes:



1 "The Federal Government may be subject to  
2 criticism if it continues the  
3 registration of pesticides supported by  
4 suspect test data."

5 What is that reference to?

6 A. I don't know. I can speculate that  
7 it may refer to studies which may have been conducted  
8 by laboratories such as IBT in which the validity of  
9 those studies came into question, but I'm doing little  
10 more than speculating because, again, this was not an  
11 audit of our program and I have no idea what studies  
12 the Auditor General examined in coming to that  
13 statement.

14 Q. The sentence goes on:

15 "Also, many currently registered  
16 pesticide products have not been fully  
17 evaluated for environmental risks."

18 Mr. Kingsbury, do you agree with that  
19 assessment?

20 MR. KINGSBURY: A. Within the area of my  
21 expertise; i.e., forestry products, no, I would not.

22 Q. Mr. Kingsbury, do you have Exhibit  
23 712 handy?

24 A. Can you identify it, please?

25 Q. It's a document you filed, it's on

1 page 275.

2 THE CHAIRMAN: What is the exhibit?

3 MR. CASTRILLI: It's Exhibit 712. It's  
4 the document entitled: Pesticides in Forestry and  
5 Agriculture, Effects on Aquatic Habitats.

6 MR. KINGSBURY: You are referring to the  
7 portion of the document authored by Mr. Ernst?

8 MR. CASTRILLI: Yes, the same editor of  
9 Exhibit 762, the Environment Canada Report on  
10 Fenitrothion.

11 MR. MARTEL: What page?

12 MR. CASTRILLI: Sorry, page 275.

13 MR. MARTEL: Thank you.

14 MR. CASTRILLI: Q. And we are looking at  
15 the last full paragraph on that page before the heading  
16 6.2.

17 MR. KINGSBURY: A. Yes.

18 Q. And Mr. Ernst states:

19 "Few of the presently registered  
20 pesticides have had anything that  
21 approaches intensive review since most  
22 were registered for use in the years when  
23 environmental impacts and human health  
24 effects were not adequately considered.  
25 It has been estimated that only 15 per

1 cent of the pesticide active ingredients  
2 presently registered have ever been  
3 reviewed by Environment Canada, let alone  
4 been subjected to the testing detail we  
5 now know is necessary to predict  
6 environmental fate and behaviour."

7 And then dropping down:

8 "A high priority needs to be put on the  
9 systematic re-evaluation of all currently  
10 registered pesticides."

11 Do you agree with that assessment?

12 A. No, I would not agree with it. That  
13 is what the author says.

14 I would, first of all, point out there is  
15 no reflection there on the forestry products, it does  
16 not in any way contradict my assertion that forestry  
17 products have, in fact, been evaluated.

18 I would also point out that I'm aware of  
19 Mr. Ernst's position and he's not directly involved in  
20 the registration process that I spelled out to you.

21 Q. Sorry. Your testimony is he's not --  
22 would you like to tell me what note it was that Dr.  
23 Ritter passed to you?

24 DR. RITTER: A. I can read that into the  
25 record, if you like.

1                   Q. Well, do you have any expertise in  
2 this area, Dr. Ritter?

3                   A. It's got nothing to do with the  
4 question you asked. Would you like it read into the  
5 record, Mr. Castrilli? My pleasure.

6                   MR. CASTRILLI: Mr. Chairman, I really  
7 don't think it's appropriate for the witnesses to be  
8 talking to each other during the course of  
9 cross-examination, particularly if their expertise does  
10 not relate.

11                  THE CHAIRMAN: I think we should caution  
12 the witnesses that perhaps passing notes between each  
13 other looks suspicious, although it may be completely  
14 innocuous.

15                  In other words, the questions put to  
16 witnesses should elicit answers from those witnesses to  
17 whom they are directed without assistance from other  
18 witnesses, unless there is a deferral to the other  
19 witness.

20                  DR. RITTER: I accept the criticism. We  
21 won't do it again.

22                  MR. CASTRILLI: Q. Now, continuing with  
23 Exhibit 768, -- sorry, Dr. Ritter, we are now looking  
24 at Section 8.53 again.

25                  DR. RITTER: A. Yes.

1 Q. The Auditor General says:  
2 "We found there is a need to re-evaluate  
3 many products, some of which have been  
4 registered on the basis of data  
5 subsequently found to be invalid."

6 It seems to be the same comment arose  
7 earlier when the Auditor General used the phrase  
8 "suspect test data". Can you cast any light on what  
9 the Auditor General's referring to there, or is your  
10 response the same to this comment as to the last one?

11 A. Mr. Castrilli, my response is the  
12 same to the document in its entirety. The document is  
13 entitled, as you pointed out, An Audit of the  
14 Department of Agriculture Program Relating to the  
15 Evaluation of Pesticides.

16 Anything I have given you is little more  
17 than conjecture because I did not play a part in the  
18 audit carried out by the Auditor General of a program  
19 administered by the Department of Agriculture.

20 MS. MURPHY: And, in addition, whatever  
21 program this document is about, the witness could not  
22 possibly be asked to give information about what the  
23 Auditor General meant. We've had that sort of  
24 discussion before in other contexts.

25 THE CHAIRMAN: That's right. This



1 harkens of the Dean Baskerville discussion over what  
2 was meant by him in his document Exhibit 16.

3 So I think you can ask fairly the witness  
4 whether or not he agrees with whatever is here, but he  
5 really can't speculate on what was meant by the author.

6 MR. CASTRILLI: I wasn't asking him to  
7 speculate beyond whether he agrees or not. I'm content  
8 with whether he agrees or not, to the extent he knows.

9 DR. RITTER: You are referring to the  
10 first sentence in 8.53:"

11 "We found that there is a need to  
12 re-evaluate many products, some of which  
13 have been registered on the basis of data  
14 subsequently found to be invalid."

15 Insofar as health and safety data are  
16 concerned, let me say that with regards to the IBT  
17 situation, for example, I am not aware of any important  
18 data gaps that remain as a result of invalid IBT data.  
19 So that, to the best of my knowledge, this statement  
20 could not, or at least should not refer to invalid test  
21 data supporting health and safety studies.

22 THE CHAIRMAN: Invalid in terms of  
23 fraudulent as opposed to studies that you just don't  
24 agree with?

25 DR. RITTER: That's correct. So I would

1 not agree with that statement in the context of health  
2 and safety studies.

3 MR. CASTRILLI: Q. Dr. Ritter, we have  
4 been talking about IBT off and on for the last two  
5 weeks.

6 I just wanted to ask you, in light of an  
7 excerpt of a document I provided to you which  
8 summarizes the IBT situation, whether you agree with  
9 the summary provided there.

10 MR. CASTRILLI: And to do that, Mr.  
11 Chairman, I would like to make the document I'm  
12 referring to the next exhibit. It's a United States  
13 House of Representatives Committee on Government  
14 Operations entitled: Problems Plague the Environmental  
15 Protection Agency's Pesticide Registration Activities,  
16 and it's dated 1984 and I'm again providing excerpts  
17 only.

18 Q. Dr. Ritter, you have a copy of that;  
19 is that right?

20 DR. RITTER: A. Yes, I do.

21 MR. CASTRILLI: (handed)

22 THE CHAIRMAN: Thank you. Exhibit 769.

23 ---EXHIBIT NO. 769: Document entitled: Problems  
24 Plague the Environmental  
25 Protection Agency's Pesticide  
Registration Activities, dated  
1984, issued by the United States

1 House of Representatives Committee  
2 on Government Operations.

3 MR. CASTRILLI: Q. Dr. Ritter, I'm  
4 referring you to page 28 of what is now Exhibit 769.

5 DR. RITTER: A. Yes.

6 Q. It's a heading entitled: VI Quality  
7 of Data Supporting Pesticide Registrations and EPA's  
8 Review and Inspection Procedures.

9 The only part I'm really interested in is  
10 Part A which is: Falsified Studies Submitted by  
11 Industrial Biotest Laboratories.

12 I'm wondering if I could, Dr. Ritter,  
13 just ask you to read the entirety of Part A and then  
14 just simply advise the Board whether you agree with the  
15 summary there respecting the IBT situation, Canada's  
16 involvement, and otherwise indicate where you don't  
17 agree and why you don't agree?

18 A. You are asking if I -- this is an  
19 audit of the U.S. program. What's your question, Mr.  
20 Castrilli?

21 Q. Whether you agree -- well, Dr.  
22 Ritter, it was a review of a U.S. program, but it notes  
23 Canada's involvement in the re-evaluation of the  
24 documents and you were involved in the process of  
25 re-evaluation for that period.

1                   So what I want from you really is an  
2                   indication of whether you agree with the summary?

3                   A. I think the details in paragraph -- I  
4                   should say perhaps that I was not involved with the IBT  
5                   audit and validation program in Canada. I think  
6                   paragraph (a) reasonably reflects the historical  
7                   perspective of how this story unfolded, yes.

8                   Q. Okay, that's fine. Sorry, you mean  
9                   Part A; is that right?

10                  A. Yes.

11                  Q. Okay.

12                  MS. MURPHY: Just with respect to this,  
13                  I'm a little confused, I'm not entirely sure about the  
14                  background.

15                  Can Mr. Castrilli advise, am I correct  
16                  that these committees are situations in which there are  
17                  witnesses before a committee and a report produced  
18                  after the committee hears evidence or information from  
19                  a series of witnesses?

20                  MR. CASTRILLI: Mr. Chairman, this is the  
21                  Final Report of the Committee on Government Operations  
22                  dated October 5, 1984.

23                  It is my understanding, though I am  
24                  obviously not in a position to give evidence about it,  
25                  but the way these reports are produced are one of two

1 ways; either -- or first, the committee holds hearings,  
2 invites submissions from any and all, and on the basis  
3 of the submissions produces a report such as this; or,  
4 (b) it, because it has investigative capabilities, will  
5 simply go out and investigate a matter and produce a  
6 report.

7 I believe it's clear from the excerpt  
8 that hearings were held prior to the production of this  
9 report. So I think the exercise that we have gone  
10 through in this case was the former, not the latter.

11 MS. MURPHY: And if that's the situation,  
12 given that I don't have the entire report, is there any  
13 way for the Board to be advised whether there were any  
14 Canadian witnesses called by this committee?

15 THE CHAIRMAN: Well, I'm not sure, Ms.  
16 Murphy, that Mr. Castrilli wants to go into it to that  
17 extent.

18 If your sole question, Mr. Castrilli, is:  
19 Is this a reasonable approximation of the chronology  
20 and the history of the IBT event, then you have  
21 answered--

22 DR. RITTER: Yes.

23 THE CHAIRMAN: --it reasonably reflects,  
24 to your knowledge, what those events were. Is that  
25 sufficient?



1 MR. CASTRILLI: Yes, that's all I wanted  
2 with respect to pages 28 and 29.

3 THE CHAIRMAN: I guess what I'm --

4 MS. MURPHY: Fair enough with respect to  
5 pages 28 and 29, but the witness already said that he  
6 understood that to be accurate.

7 THE CHAIRMAN: That's right. And I don't  
8 think Mr. Castrilli wants to pursue it much farther  
9 than that.

10 MR. CASTRILLI: Q. Dr. Ritter, the  
11 period that really one can associate with the  
12 commencement or the revelation of the IBT problems and  
13 the resolution of the IBT problems, at least  
14 administratively within the Government of Canada, would  
15 the period 1976 to 1983 be roughly the period we're  
16 talking about?

17 DR. RITTER: A. Roughly, but I would  
18 simply caution, Mr. Castrilli, that I was not involved  
19 with the IBT audit program.

20 Q. But to your knowledge, the period I  
21 outlined 197 -- sorry, 1976 to 1983 is roughly the  
22 period of the height of Health and Welfare Canada's  
23 involvement in re-evaluations and the like; is that  
24 right?

25 A. Yes, I believe that is about the time

1 period.

2 Q. I am referring you to page 46 of the  
3 same exhibit. Sorry, we are looking at paragraph 2.  
4 The summary indicates -- or the report indicates:

5 "It took EPA seven years to determine  
6 which of the IBT studies were invalid  
7 and, if so, whether they were essential  
8 to the approval of particular pesticide  
9 registrations and would, therefore,  
10 require replacement studies."

11 That exercise, again, was one that, in  
12 that period of time, covered Canada's involvement as  
13 well; is that right?

14 A. I really don't know, Mr. Castrilli.

15 MR. CASTRILLI: Mr. Chairman, we are at  
16 the point in the day where it might be advisable to  
17 adjourn for the day. I could probably shorten this up  
18 overnight and not impede unduly on Mr. Hanna's  
19 cross-examination tomorrow.

20 THE CHAIRMAN: Okay. In that respect,  
21 would you anticipate that you wouldn't be longer than  
22 an hour in the morning?

23 MR. CASTRILLI: I fully intend, no matter  
24 what happens, to be no more than an hour.

25 THE CHAIRMAN: Okay. In that case, we

1 will adjourn. I am going to ask, if we can, that we  
2 have an early start tomorrow. I realize it's placing a  
3 considerable burden on everyone, including the Board,  
4 in view of the length of time we have sat today, but in  
5 view of our re-arrangement of the schedule for next  
6 week, we would endeavour tomorrow to have OFAH commence  
7 without wasting much time in the morning and finish at  
8 least, if they can, their entire cross-examination or,  
9 if not, leaving as little as possible for when we  
10 return.

11 In that respect, we are suggesting eight  
12 o'clock for a start tomorrow. You can participate in  
13 the festivities tonight, but bear in mind--

14 MS. MURPHY: It sounds like we are going  
15 to be a little...

16 THE CHAIRMAN: --but bear in mind that we  
17 would expect you to be here ready to go wide-eyed and  
18 bushy-tailed at eight.

19 MS. SEABORN: Mr. Chairman, will we be  
20 revisiting the issue tomorrow of when these witnesses  
21 will be returning for those who have not  
22 cross-examined, who would not have completed their  
23 cross-examination?

24 I don't think we had decided on a date  
25 and I would like to know, by the end of tomorrow for

1 future scheduling, what that date would be.

2 THE CHAIRMAN: Well, okay. We will  
3 certainly, as we find out how we proceed tomorrow with  
4 OFAH, we I think will then be able to make a reasonable  
5 estimate about how long we have to complete this panel.

6 If it means the two days, or two days  
7 would be sufficient or appears to be sufficient, then  
8 we would probably look at the 8th and 9th as opposed to  
9 splitting it up between the 5th and the 8th and 9th --  
10 or the 6th rather, and the 8th and 9th.

11 MS. BLASTORAH: 6th, 7th and 8th, Mr.  
12 Chairman.

13 THE CHAIRMAN: Sorry, 7th. Whatever it  
14 is. There is a Wednesday in there where Dr. Ritter  
15 can't be with us.

16 DR. RITTER: I think we were referring to  
17 the Thursday and Friday of the first full week of  
18 September.

19 THE CHAIRMAN: That's right. But we will  
20 know that better, I think, tomorrow. If OFAH hasn't  
21 completed, then it may be that we need the three days.

22 Certainly we are going to finish one way  
23 or another, even if we have to sit until midnight, both  
24 Dr. Ritter and Mr. Kingsbury in that first week, given  
25 Mr. Kingsbury's unavailability after that.

1 Yes?

2 MS. CRONK: Mr. Chairman, just before you  
3 rise, there is a number of documents that are  
4 outstanding from our cross-examination that I would  
5 like to file now, if it would be convenient.

6 THE CHAIRMAN: Okay. Let's do that.

7 MS. CRONK: The first, you will recall,  
8 was an extract from the World Health Organization  
9 Report concerning 2,4-D and you reserved the No. 718  
10 for that.

11 THE CHAIRMAN: Okay.

12 MS. CRONK: (handed)

13 THE CHAIRMAN: Thank you.

14 MS. CRONK: Sorry, Mr. Chairman. The  
15 next is a copy of the decision in Palmer, et al, versus  
16 the Nova Scotia Forest Industries in the decision of  
17 the Nova Scotia Supreme Court Trial Division, Mr.  
18 Justice Nunn, N-u-n-n, September 15, 1983.

19 Now, I am in your hands as to whether you  
20 wish to attach --

21 THE CHAIRMAN: Well, do you object to it  
22 going in as an exhibit--

23 MS. CRONK: No, sir.

24 THE CHAIRMAN: --given the fact that it  
25 probably contains some discussion of scientific issues?



1 MS. CRONK: Not all all, sir.

2 THE CHAIRMAN: All right. Let's give it  
3 an exhibit number. 770.

4 MS. CRONK: (handed)

5 THE CHAIRMAN: Thank you.

6 ---EXHIBIT NO. 770: Copy of the decision in Palmer, et  
7 al, versus the Nova Scotia Forest  
8 Industries in the decision of the  
Nova Scotia Supreme Court Trial  
Division, September 15, 1983.

9 MS. CRONK: The next, Mr. Chairman, for  
10 the benefit of my friends, is a complete copy of the  
11 Crump Report, Exhibit 716.

12 (handed)

13 THE CHAIRMAN: Thank you. Now, should we  
14 substitute this for what we already had in which were  
15 the excerpts of 716?

16 MS. CRONK: My recommendation would be,  
17 sir, that you maintain in your files the extract that  
18 was used and just append to it the number 716A, so that  
19 you know what document was in fact used during that  
20 cross-examination and then this is the main report,  
21 Exhibit 716.

22 THE CHAIRMAN: Okay. So the excerpts  
23 will be--

24 MS. CRONK: A.

25 THE CHAIRMAN: --716A. Very well.

1 MS. CRONK: Thank you.

2 THE CHAIRMAN: Thank you.

3 MS. CRONK: And then finally, sir, during  
4 the course of Mr. Castrilli's cross-examination a  
5 number of documents have been put in that are extracts  
6 of larger documents and I would like to put on the  
7 record a formal request for a copy of the following  
8 documents, the full versions thereof.

9 The first is Exhibit 729 -- perhaps I  
10 could just give them to you, Mr. Chairman, and indicate  
11 what they are. Exhibit 729, 742, 748, which are the  
12 U.S. EPA reregistration documents with respect to  
13 glyphosate, 2,4-D and picloram, the full versions of  
14 those documents.

15 And finally, sir, in Exhibit 737, which  
16 you may recall was a letter from the United States  
17 Environmental Protection Agency concerning the -- I'm  
18 sorry, to the Criteria and Standards Division Office of  
19 Drinking Water.

20 I have spoken to my friend Mr. Castrilli  
21 about this and I simply wanted it on the record. There  
22 is reference in this document, and Dr. Ritter has  
23 referred in his evidence to a memorandum dated August  
24 13, 1984, setting out the process and criteria used to  
25 select the chemicals which, you may remember, have been

1 described as priority chemicals.

2 I have asked Mr. Castrilli to use his  
3 best efforts to obtain a copy of that memorandum and to  
4 provide it to me and he has indicated that he will do  
5 so, and I would like that recorded on the record so  
6 that it's produced.

7 THE CHAIRMAN: All right. And do you  
8 have any difficulty with the other three copies of 729,  
9 742 and 748, Mr. Castrilli?

10 MR. CASTRILLI: Mr. Chairman, I have the  
11 entirety of the pic -- sorry, I have the entirety of  
12 the 2,4-D reregistration document and I will probably  
13 just leave that for reproduction tomorrow.

14 I also have the entirety of the  
15 glyphosate reregistration document and I can do the  
16 same thing.

17 I do not have all of the picloram  
18 document and will probably have to make a request for  
19 that, so that might be some time in coming, and the  
20 same is true for the August 13, 1984 memo.

21 THE CHAIRMAN: All right. As long as you  
22 use your best efforts to obtain those documents.

23 MR. CASTRILLI: I will do that.

24 MS. CRONK: Thank you, Mr. Chairman.

25 THE CHAIRMAN: Thank you.

1 Mr. Freidin?

2 MR. FREIDIN: Mr. Chairman, in relation  
3 to Panel 15, the time for filing the statement of  
4 issues was extended to the end of last week. I'm still  
5 not in receipt of the statement of issues for four of  
6 the main parties who are regular attendees here.

7 I just wanted to go on the record as  
8 requesting that that information or that documentation  
9 be provided as soon as possible.

10 THE CHAIRMAN: So noted. Thank you.

11 Okay, ladies and gentlemen, have a  
12 pleasant evening. No doubt we will see you later.

13 Thank you.

14 ---Whereupon the hearing adjourned at 6:25 p.m.,  
15 to be reconvened on Thursday, August 17th, 1989,  
commencing at 8:00 a.m.

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